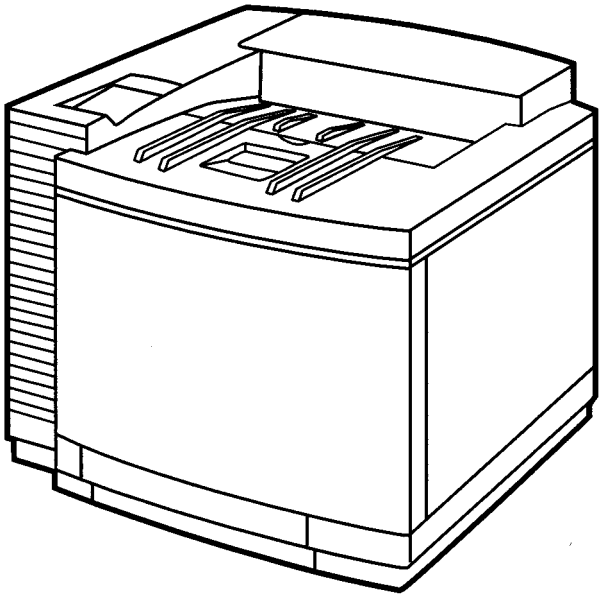
brother

Brother Color Laser Printer

HL-2400Ce series

USER'S GUIDE



Please read this manual thoroughly before using the printer.
Keep this manual in a convenient place for quick reference at all times.

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Under the supervision of Brother Industries Ltd., this manual has been compiled and published, covering the latest product descriptions and specifications.

The contents of this manual and the specifications of this product are subject to change without notice.

Brother reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

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Shipment of the Printer

If for any reason you must ship your Printer, carefully package the Printer to avoid any damage during transit. It is recommended that you save and use the original packaging. The Printer should also be adequately insured with the carrier.

WARNING

When shipping the Printer, the TONER CARTRIDGES and ALL CONSUMABLES must be removed from the Printer. **Failure to remove the CONSUMABLES during shipping will cause severe damage to the Printer and will VOID THE WARRANTY (refer to user's manual)**.

(For USA & CANADA Only)

For technical and operational assistance, please call:

In USA	1-877-284-3238	
In CANADA	1-800-853-6660	
	514-685-6464	(within Montreal)

If you have comments or suggestions, please write us at:

In USA Printer Customer Support
Brother International Corporation
15 Musick
Irvine, CA 92618

In CANADA Brother International Corporation (Canada), Ltd.
- Marketing Dept.
1, rue Hôtel de Ville
Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS
For downloading drivers from our Bulletin Board Service, call:

In USA	1-888-298-3616
In CANADA	1-514-685-2040

Please log on to our BBS with your first name, last name and a four digit number for your password. Our BBS supports modem speeds up to 14,400, 8 bits no parity, 1 stop bit.

Fax-Back System
Brother Customer Service has installed an easy to use Fax-Back System so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one you are calling from.
Please call 1-800-521-2846 (USA) or 1-800-681-9838 (Canada) and follow the voice prompts to receive faxed instructions on how to use the system and your index of Fax-Back subjects.

DEALERS/SERVICE CENTERS (USA only)
For the name of an authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers : **http://www.brother.com**



brother

Color Laser Printer

HL-2400Ce series

USER'S GUIDE

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If you have comments or suggestions, please write us at:

In USA	Printer Customer Support Brother International Corporation 15 Musick Irvine, CA 92618
In CANADA	Brother International Corporation (Canada), Ltd. - Marketing Dept. 1, rue Hôtel de Ville Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS
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For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:

Warning

Indicates warnings that must be observed to prevent possible personal injury.

Caution

Indicates cautions that must be observed to use the printer properly or prevent damage to the printer.

Note

Indicates notes and useful tips to remember when using the printer.

To Use the Printer Safely

Warning

This printer is heavy and weighs approximately 37kg (81.6 lbs). When you move or lift this printer, be sure at least 2 people lift it together.

Warning

The Fusing Unit becomes extremely HOT during operation. Wait until it has cooled down sufficiently before replacing consumables.

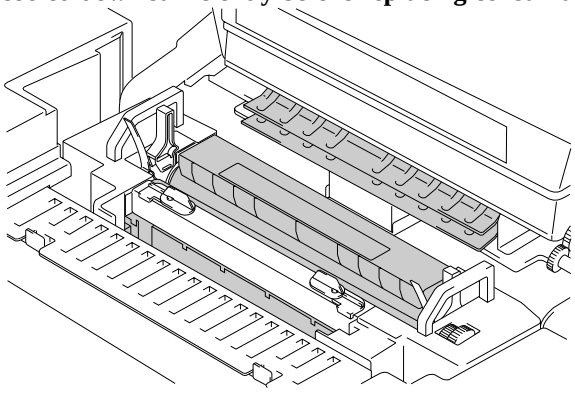


Fig. 0-1 Fusing unit

Warning

If metal objects, water or other liquids get inside the printer, turn the printer off immediately and unplug the printer. Contact your dealer.

Warning

Do not put consumables such as the Toner Cartridges and the Waste Toner Pack into a fire. Some consumables can be flammable under certain conditions.

Warning

Do not look directly at the laser beam light. It might cause damage to your eyesight. Do not remove or break open the printer's safety interlocks.

Warning

Do not run the printer with the Top Cover, Front Cover and Rear Access Covers open and the interlocks removed.

Warning

Turn off the printer before replacing consumables.

Warning

Do not place any items on the printer.

Warning

In case of a fuser oil spill, you must clean it up immediately .

Printer Do's and Don'ts for Optimum Print Quality

Caution

Before you move or lift the printer, remove the Toner Cartridges, Waste Toner Pack, Oil Bottle and Fusing Unit to avoid spills. Be sure to keep the printer as level as possible. Damage caused by failure to remove the supplies will void your warranty.

Caution

Do not touch the rollers of the Fusing Unit. This can degrade print quality.

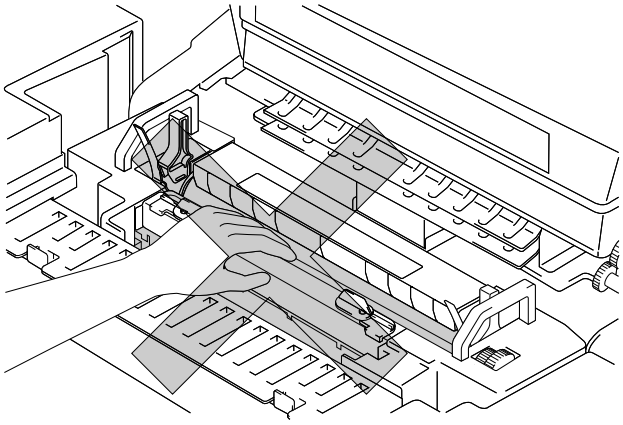


Fig. 0-2 Fusing Unit Rollers

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IMPORTANT INFORMATION: REGULATIONS

Electronic Emission Notices

WITHOUT the Network Card NC-2010h, NC-2100h

Federal Communications Commission(FCC) Declaration of Conformity (For U.S.A. Only)

Responsible Party : Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911, U.S.A.
TEL : (908) 704-1700

declares, that the products

Product Name : Brother Color Laser Printer HL-2400Ce
Model Numbers : HL-C1
Product Options : Lower Tray Unit LT24CL(LFU-1), HDD (HD-6G), NC-3100h

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada Only)

This Class B digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Declaration of Conformity (For Europe)

We, Brother Industries, Ltd.,
15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan

declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class B,	EN 55024

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by: Brother Industries, Ltd.
Printer Products Division

Radio Interference (220-240 V Model Only)

This printer complies with EN55022(CISPR Publication 22)/Class B.

Before this product is used, ensure that you use a double-shielded interface cable with twisted-pair conductors and that is marked "IEEE 1284 compliant". The cable must not exceed 1.8 meters in length.

WITH the Network Card NC-2010h, NC-2100h

EMC Notice

Warning

This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Federal Communications Commission(FCC) Compliance Notice (For U.S.A. Only)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class A digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada Only)

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Declaration of Conformity (For Europe)

We, Brother Industries, Ltd.,
15-1, Naeshiro-cho, Mizuho-ku, Nagoya 467-8561, Japan

declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class A,	EN 55024

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by: Brother Industries, Ltd.
Printer Products Division

Radio Interference (220-240 V Model Only)

This printer complies with EN55022(CISPR Publication 22)/Class A.

Before this product is used, ensure that you use a double-shielded interface cable with twisted-pair conductors and that is marked "IEEE 1284 compliant". The cable must not exceed 1.8 meters in length.

International ENERGY STAR® Compliance Statement

The purpose of the International ENERGY STAR® Program is to promote the development and popularization of energy-efficient office equipments.
As an ENERGY STAR® Partner, Brother Industries, Ltd. has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Laser Notices

Laser Safety (For 120 V Model Only)

This printer is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA Regulations (For 120 V Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States.

Caution: Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

IEC 825 Specification (For 220 - 240 V Model Only)

This printer is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.



This printer has a Class 3B Laser Diode that emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution: Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The following caution label is attached on the cover of the scanner unit.



For Finland and Sweden

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.
Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

Safety Information

IMPORTANT - For Your Safety

To ensure safe operation the three-pin plug supplied must be inserted only into a standard three-pin power point that is effectively grounded through the normal household wiring.

Any extension cords used with this printer must be three-conductor and be correctly wired to provide connection to ground. Improper extension cords are a major cause of fatalities.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, consult a qualified electrician.

Disconnect device
This printer must be installed near a power outlet that is easily accessible. In case of emergencies, you must disconnect the power cord from the power outlet to shut off the power completely.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

Wiring Information (For U.K. only)

Important

If the mains plug supplied with this printer is not suitable for your socket outlet, remove the plug from the mains cord and fit an appropriate three pin plug. If the replacement plug is intended to take a fuse then fit the same rating fuse as the original.

If a moulded plug is severed from the mains cord then it should be destroyed because a plug with cut wires is dangerous if engaged in a live socket outlet. Do not leave it where a child might find it!

In the event of replacing the plug fuse, fit a fuse approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug with the cover omitted.

WARNING - THIS PRINTER MUST BE PROPERLY EARTHED.

The wires in the mains cord are coloured in accordance with the following code:

Green and yellow:	Earth
Blue:	Neutral
Brown:	Live

The colours of the wires in the main lead of this printer may not correspond with the coloured markings identifying the terminals in your plug.

If you need to fit a different plug, proceed as follows.

Remove a length of the cord outer sheath, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If the construction of the plug permits, leave the green and yellow wire longer than the others so that, in the event that the cord is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter “E” or by the safety earth symbol ⏚ or coloured green or green and yellow.

The wire that is coloured blue must be connected to the terminal which is marked with the letter “N” or coloured black or blue.

The wire which is coloured brown must be connected to the terminal that is marked with the letter "L" or coloured red or brown.

The outer sheath of the cord must be secured inside the plug. The coloured wires should not hang out of the plug.

CHAPTER 1
INTRODUCTION

ABOUT THIS MANUAL

This manual acts as your guide to the setup and operation of your printer and covers the following topics:

CHAPTER 1 INTRODUCTION provides an overview of the printer. Read this chapter first to get familiar with the printer.

CHAPTER 2 SETTING UP THE PRINTER gives you general set-up information about this printer. Be sure to read this chapter before you use the printer.

CHAPTER 3 BEFORE WORKING WITH THE PRINTER provides detailed information for setting up the printer to work with your computer and software. Be sure to read this chapter *before* you work with the printer.

CHAPTER 4 CONTROL PANEL details the functions of the panel buttons and LEDs.

CHAPTER 5 MAINTENANCE provides guidance on how to maintain your printer.

CHAPTER 6 TROUBLESHOOTING helps you troubleshoot the printer in case of problems.

APPENDICES contain printer specifications and paper specifications.

INDEX provides an alphabetical list of the contents of this manual.

Notes

When you read this User's Guide, note the following:

- This User's Guide contains instructions or steps to teach you various operations of the printer. Please remember that the instructions always assume that you start with the factory settings, particularly in Chapter 2 and Chapter 3. If you change the settings, particularly the emulation mode, the display messages change accordingly.
- The paper size has been factory set to letter or A4, depending upon the final destination of the printer. Some display messages appear differently according to this setting.

ABOUT THIS PRINTER

Features

This printer has the following standard features.

2400 x 600 DPI Class Resolution

This printer prints at a default resolution of 600 dots per inch (dpi). By utilizing the 300-dpi mode, the printer can also print lower resolution data, if necessary. Moreover, you can achieve higher print quality equivalent to 2400x600 DPI resolution by utilizing these Brother technologies:- High Resolution Control (HRC) and Color Advanced Photoscale Technology(CAPT).

High Speed and Color Laser Printing

You can print crisp images in brilliant 24 bit color.
This printer can print at speeds up to 16 pages per minute in monochrome mode and 4 pages per minute in full color mode. The HL-2400Ce controller utilizes a high speed 64-bit RISC microprocessor and special hardware chips, to ensure fast print job processing.

Color Advanced Photoscale Technology (CAPT)

This printer can print graphics in 256 shades for each color in HP® color printer PCL5C™ emulation and BR-Script level 2, producing nearly photographic quality. CAPT is most effective when printing photographic images.

High Resolution Control (HRC)

The High Resolution Control (HRC) technology provides clear and crisp printouts and improves even 600-dpi resolution output. HRC is most effective when printing text.

Maintenance-Free and Economical Toner Cartridge

The toner cartridge can print up to 10,000 (Black) and 6,000 (Cyan, Magenta and Yellow) single-sided pages at 5% coverage. This printer uses one piece, easy-to-replace toner cartridges.

Universal Media Cassette

This printer loads paper automatically from the media cassette. Since the media cassette is a universal type, a number of different paper sizes can be used. Even envelopes can be loaded from the media cassette. For detailed paper specifications, see 'Paper Handling' in Chapter 3.

Three Interfaces

This printer has a high speed bi-directional parallel interface, an RS-232C serial interface and a modular input/output (MIO) compatible interface. As an alternative to the MIO interface, you can use the Brother NC-3100h Networking solution.

If your application software supports the bi-directional parallel interface, you can monitor the printer status. It is fully compatible with the industry-standard bi-directional parallel interface.

The industry standard RS-232C serial can connect to any computer using a standard serial cable.

The MIO interface allows you to install a commercial MIO-compatible card. If you install a card, you can use one more interface ports for networking or printer sharing.

The NC-3100h card will allow you to connect directly to a Network.

Automatic Interface Selection

This printer can automatically select the bi-directional parallel, RS-232C serial or MIO / NC-3100h interface depending on the interface port through which it receives data. With this feature, the printer can be connected to more than one computer.

Five Emulation Modes

This printer can emulate the Hewlett-Packard® Color PCL® 5C language (PCL6® in monochrome printing) printers, PostScript® Level 2 language emulation (Brother BR-Script Level 2) printers, the industry-standard HP-GL™ plotter as well as EPSON® FX-850™ and IBM® Proprinter XL® printers (for monochrome printing only). You can print with all application programs that support one of these printers.

Automatic Emulation Selection

This printer can automatically select the printer emulation mode depending on the print commands it receives from the computer software. With this feature, many users can share the printer on a network.

Data Compression Technology

This printer can internally compress the received graphics and font data in its memory so that it can print larger graphics and more fonts without the need for additional memory.

Fonts

This printer has 72 scalable and 12 bitmapped fonts. The fonts that can be used vary according to the selected emulation mode.
In PCL mode, you can also print the 11 kinds of bar codes listed below.
In BR-Script mode, the printer has 66 scalable fonts.

Bar Code Printing

This printer can print the following 11 types of bar codes:

- Code 39
- Interleaved 2 of 5
- EAN-8
- EAN-13
- UPC-A
- EAN-128
- UPC-E
- Codabar
- US-PostNet
- ISBN
- Code 128

CCITT G3/G4

Since this printer supports the CCITT G3/G4 format in addition to HP-compatible formats, it can quickly receive and print data compressed in this format.

Lock Panel

If the panel button settings have been changed, the printer may not work as you expect. If you are an administrator of this printer, you can lock your settings to prevent changes from being made.

Power Save Mode

This printer has a power saving mode. Since laser printers consume power to keep the fixing assembly at a high temperature, this feature can save electricity when the printer is on but not being used. The factory setting of the Power Save mode is ON so that it complies with the new EPA Energy Star specification.

Toner Save Mode

This printer has an economical Toner Save Mode. By using this feature you can substantially reduce operating costs and extend the life expectancy of the toner cartridges.

Reprint Function

You can reprint the last print job with a touch of a panel button, which allows reprinting of multiple copies of the job without sending the data again from the computer.
When there is not enough memory to print the last job, you can reprint the last print page.

PCMCIA Card Slot

The printer has 2 Type II PCMCIA card slots that also allow the use of 1 Type III device. You can install PCMCIA-compatible flash memory and HDD cards.

- Flash memory card: You can store fonts, macros, logos and other print data.
- HDD card: You can store fonts, macros, logos and other print data as well as keeping data for printer usage analysis.

Saving User Settings

You can personalize the printer by customizing your own control panel button settings. Two sets of user settings can be stored.

Options

The following options are available for this printer:

Paper Handling

Lower Tray Unit

A lower tray unit expands the paper source capacity. You can load extra paper or different sizes of paper. You can load Letter, A4, B5 (JIS and ISO) or Executive size (176x250 to 215.9x297mm) paper and Com10, DL size envelopes into this cassette.

Legal Cassette

If you wish to print on Legal sized paper, you must use this cassette.

The following commercial business products can also be installed into this printer:

Network

NC-3100h

Installing an NC-3100h enables you to use the printer in the following environments:
(TCP/IP, IPX/SPX, AppleTalk, DLC/LLC, VINES, LAT, NetBEUI)
Also, many useful utilities such as BR-Admin and Brother Network Printing software for the Network administrator are included. For details of the utilities, see the documentation included on the CD-ROM.

MIO Card (NC-2010h/NC-2100h)

An MIO Network Card provides a means for attaching the printer to a network. Some models of this printer include an MIO Card as standard.

PCMCIA CARDS

Flash Memory Card and HDD Card

A commercial flash memory card or an HDD card can be installed. You can store fonts, macros, logos, and other print data in a commercial PCMCIA-compatible flash memory card or HDD card.

By using the Card, you can do logging and custom web functions. You also can use the Brother Analysis Tool software and the Brother Card Monitor software. For more details on these utilities, please refer to the documentation included on the CD-ROM.

HDD (Hard Disk Drive)

By installing an optional HDD, you can save multiple print jobs onto it. You can also select your print job and re-print it through the network.

RAM

RAM Expansion

By installing commercial memory modules you can expand the memory capacity up to 288 Mbytes.

> **Note**
> Installation instructions for each of these options is contained in the manual supplied with the option.

Operating and Storage Environment

Please note the following requirements before using the printer.

Power Supply

Use the printer within the specified power range.

AC power:	±10% of the rated power voltage
Frequency:	50/60 Hz (120V or 220-240 V)

The power cord, including extensions, should not exceed 5 metres (16.5 feet).

Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier, shredder, etc. If you must use the printer with these appliances, we recommend that you use a voltage transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

Use the printer only within the following ranges of temperature and humidity.

Ambient temperature:	10°C to 32.5°C (50°F to 90.5°F)
Ambient humidity:	20% to 80% (without condensation)

Do not block the air exit on top of the printer. Do not place objects on top of the printer, especially on the air exit.

Ensure that the printer Ozone Filter is installed at all times.

Ventilate the room where you use the printer.

Do not place the printer where it will be exposed to direct sunlight. Use blinds to protect the printer from direct sunlight if set up near a window is unavoidable.

Do not install the printer near devices that contain magnets or generate magnetic fields.

Do not subject the printer to strong physical shocks or vibrations. Do not expose the printer to open flames or salty or corrosive gasses.

Place the printer on a flat, horizontal surface.

Keep the printer clean. Do not install the printer in a dusty place.
Do not install the printer near an air conditioner.

The following figure details the recommended area around the printer for proper ventilation, operation and maintenance.

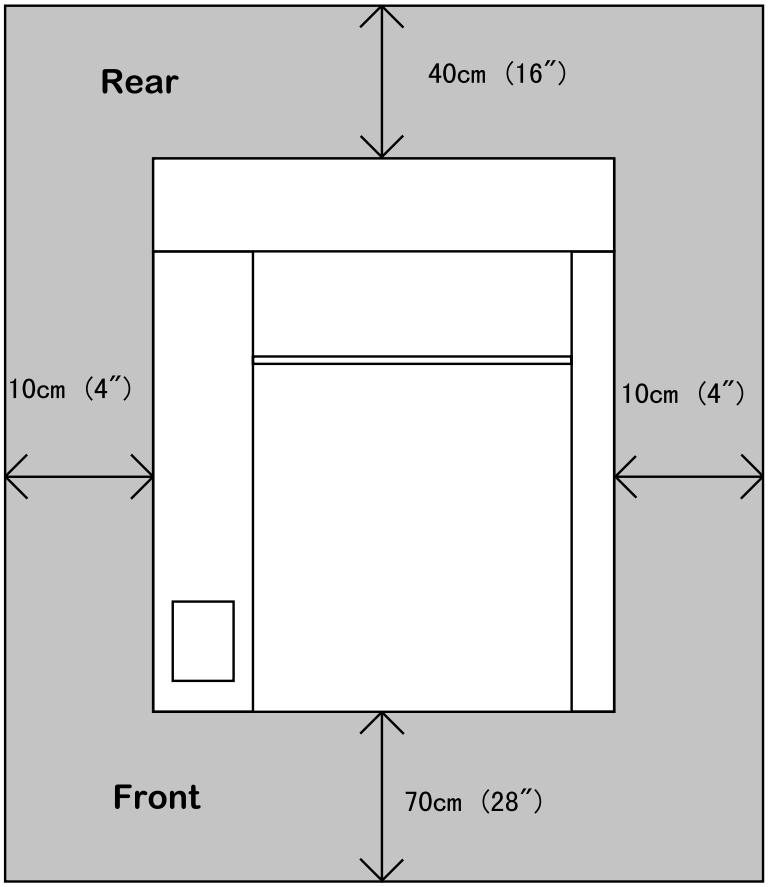


Fig. 1-1 Recommended area around the Printer

> **Note**
> Ensure that there is enough space behind the printer so that you can easily access the rear cover if a paper jam occurs.

CHAPTER 2
SETTING UP THE PRINTER

This chapter can also be used as a quick setup guide, which provides information for setting up the printer.

BEFORE USING THE PRINTER

> **⚠ Warning**
> **This printer is heavy and weighs approximately 37kg (81.6 lbs). When moving or lifting this printer, be sure to do so with at least 2 people to avoid injury.**

Checking the Components

After unpacking the printer, check to see that you have all of the following parts:

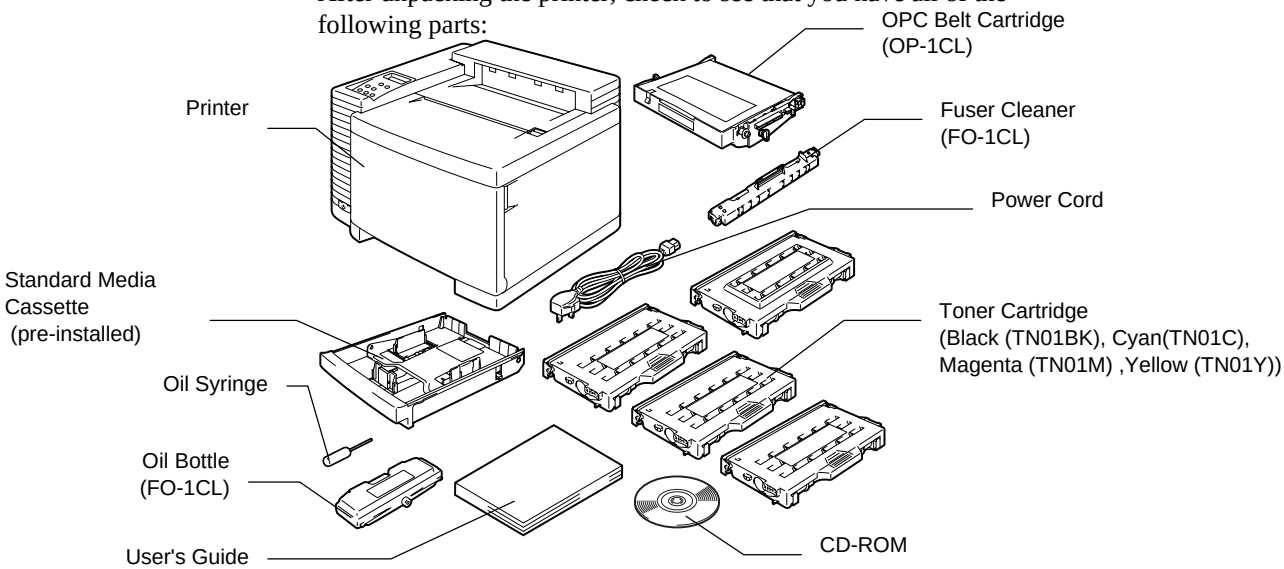


Fig. 2-1 Components in the Printer Carton

> **❗ Caution**
> The Toner Cartridges, OPC Belt cartridge, Oil Bottle and Fuser Cleaner are packed inside a separate carton as a starter kit. Do not open them now. Only open them when you are ready to install them. The OPC Belt Cartridge must not be exposed to light for any length of time or it will be damaged.

Note
An interface cable is not a standard accessory. Please purchase the appropriate cable for the interface you intend to use. Parallel cables should be IEEE 1284 compliant and should not exceed 1.8 meters (6 feet) in length. The power cord may differ slightly from this diagram depending on the country where you purchased the printer.

Note
You may have additional parts not listed above, depending on which country you live in and the HL-2400Ce series model purchased.

Note
We recommend keeping spares of the following consumables at all times. When these are exhausted, the printer will cease printing.
* Toner Cartridges (TN-01BK, TN-01C, TN-01M, TN-01Y)
* Waste Toner Pack (WT-1CL)
* Oil Bottle and Fuser Cleaner (FO-1CL, CR-1CL)

General View

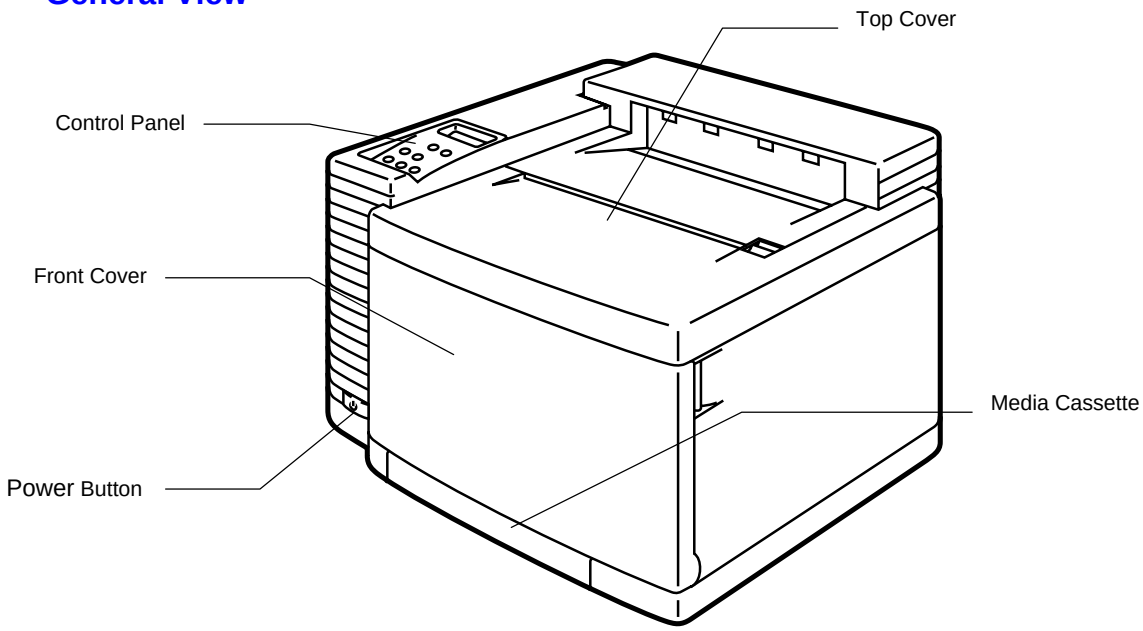


Fig. 2-2 Front View

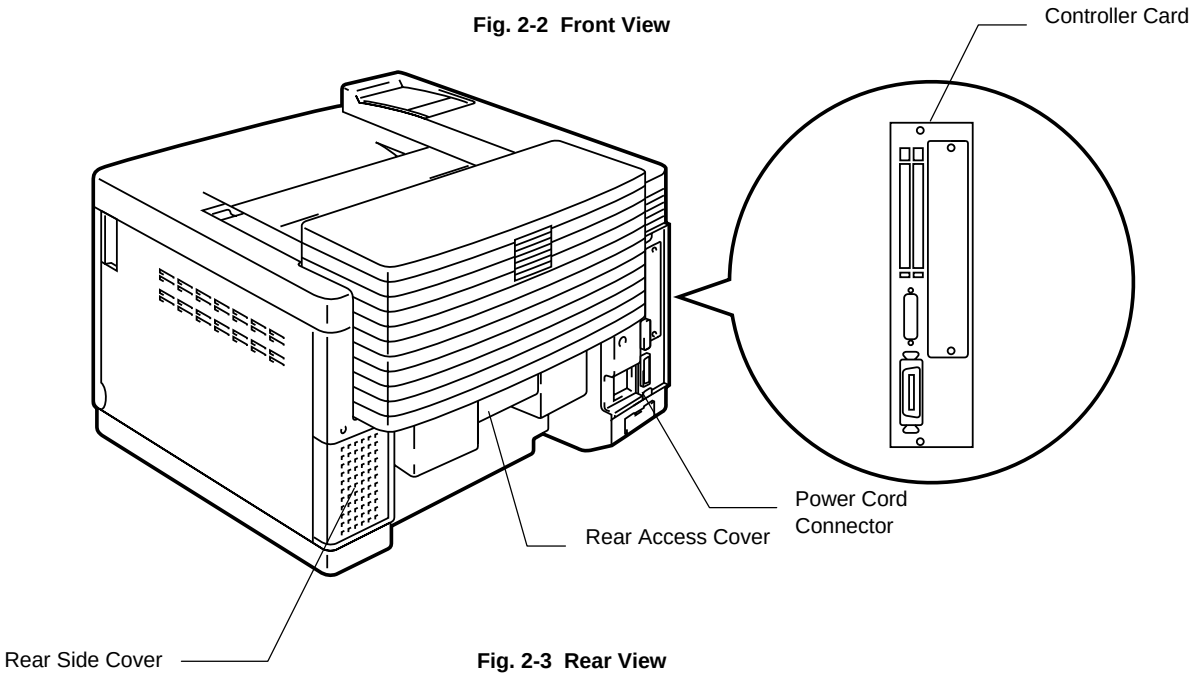


Fig. 2-3 Rear View

SETTING UP THE PRINTER

Remove the Protective Parts

After checking that you have all of the correct parts, temporarily place the printer where you can easily reach all sides. Remove the protective parts that secure the printer against damage during transportation, as shown below:

> **Important Note**
> It is CRITICAL that you SAVE all packing materials in the event you must ship or store the printer. Failure to EMPTY, CLEAN and correctly REPACK the printer according to the manufacturer's instructions BEFORE shipment will result in serious damage to the printer. This damage may not be covered by your warranty.

1. Remove the protective parts as shown below.

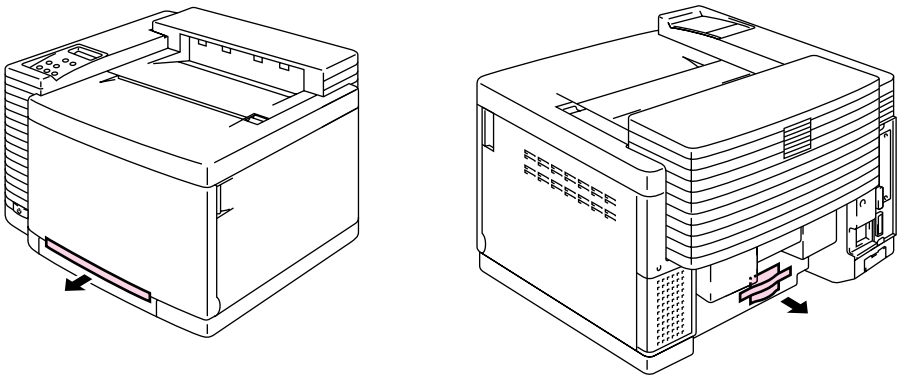


Fig. 2-4 Removing the Protective Parts

Installing the OPC Belt Cartridge

Caution

- Do not touch the green surface of the OPC Belt Cartridge. This can degrade print quality.
- Do not expose the OPC Belt to light (more than 800 lux) for more than approximately 2 minutes. It might cause damage to the OPC Belt Cartridge and void the warranty.

1. Open the Front Cover and then open the Top Cover.

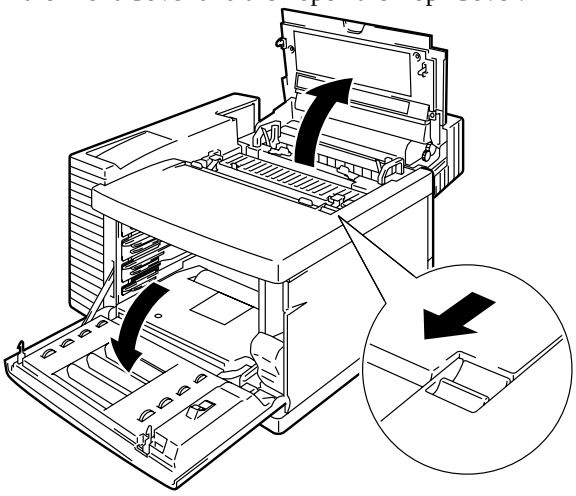


Fig. 2-5 Open the Covers

2. Release both green Belt Cartridge Lock Levers by pulling them toward you.

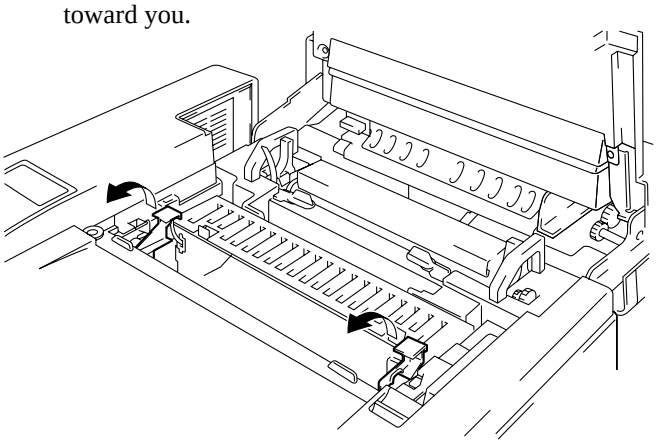


Fig. 2-6 Release the Levers

3. Remove the orange OPC Belt Tension Release Pins from both sides of the OPC Belt Cartridge.

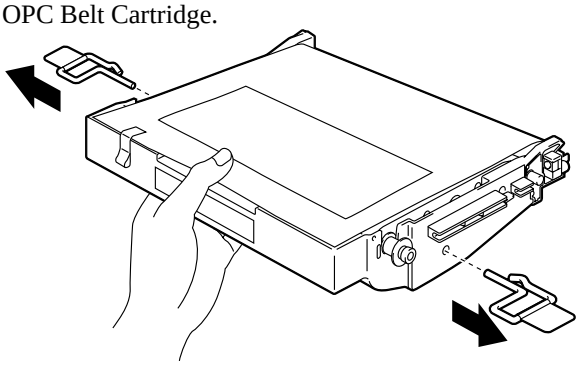


Fig. 2-7 Remove the Pins

4. Remove the Protective Sheet from the OPC Belt Cartridge.

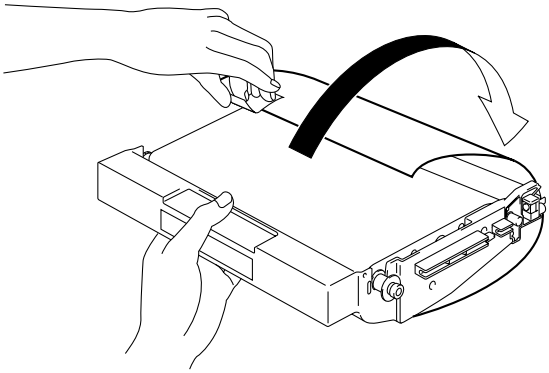


Fig. 2-8 Remove the Protective Sheet

5. Insert the OPC Belt Cartridge into the printer cartridge guide with the flat side facing you.

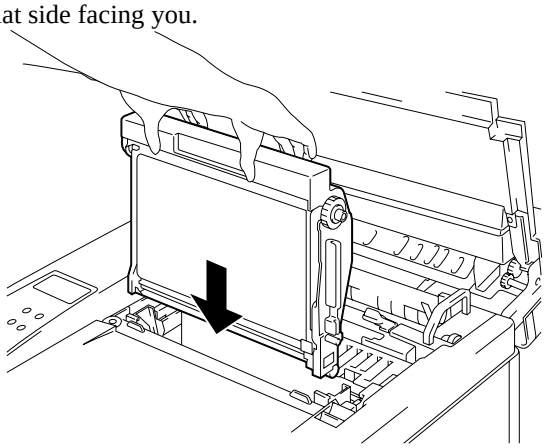


Fig. 2-9 Insert the (OPC) Belt Cartridge

6. Lock the Belt Cartridge Lock Levers by pushing them backward until they click into place.

7. Close the Top Cover.

Installing the Toner Cartridges

This printer uses 4 separate color (Black, Cyan, Magenta and Yellow) toner cartridges. One of each is supplied. A new cartridge contains enough toner to print up to 10,000 (Black): 6,000 (Cyan, Magenta, Yellow) A4 or letter-size single-sided pages at about 5% coverage. (Actual toner yield will depend on the images being printed.)

> **Note**
> The toner cartridges shipped with the printer are *starter* cartridges that contain only half the normal amount of toner. (5,000 pages (Black) and 3,000 pages (Cyan, Magenta and Yellow)).

To install the toner cartridges, follow these steps:

1. Open the Front Cover of the printer.

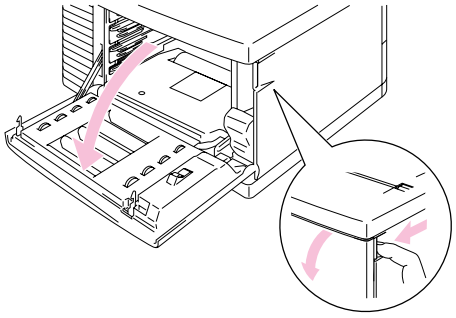


Fig. 2-10 Open the Front Cover

2. Remove the tape labeled 'REMOVE'.
3. After rocking each of the cartridges 3 to 4 times from side to side, remove the orange Protective Cover from the Toner Cartridges.

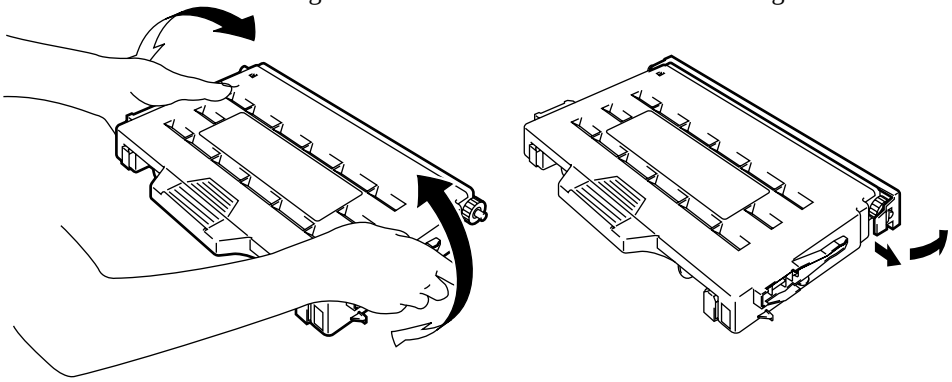


Fig. 2-11 Rocking Cartridges and Removing the Protective Cover

4. Install the 4 toner cartridges by positioning them in the correct guides. Each color cartridge is individually keyed to prevent improper installation. Match each cartridge color label to the corresponding color label on the printer.

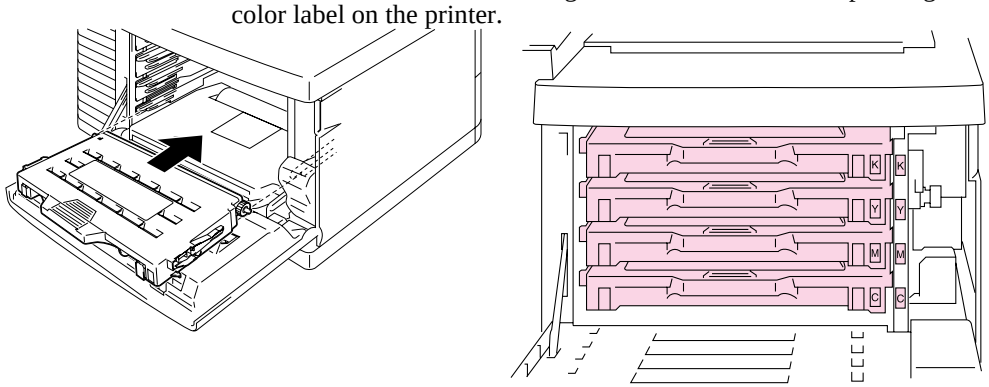


Fig. 2-12 Install the Toner Cartridges

Caution

- Insert the toner cartridges gently into the printer. Do not try to lock them into the printer by pushing them all the way into the slot. The cartridges will be correctly positioned when the front cover is closed.
- Do not stand the toner cartridge on its end or turn it upside down.
- Install the toner cartridges immediately after you remove the protective cover. Do not touch the shaded part shown below.

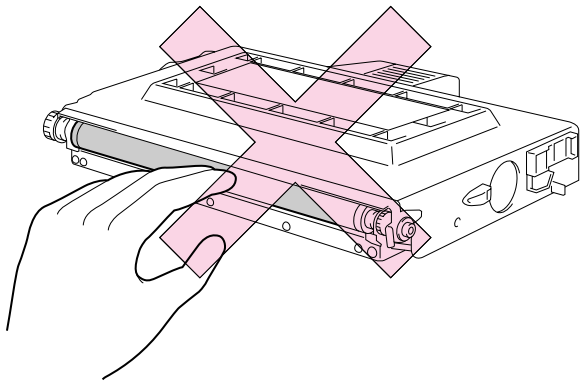


Fig. 2-13 Toner Cartridge

Installing the Oil Bottle and the Fuser Cleaner

1. Open the Top Cover and release the pressure on the Fusing Unit rollers by pushing the Pressure Release Levers to the OPEN position (①). Remove the orange protective parts fitted between the rollers of the Fusing Unit (②). Make sure that the Pressure Release Levers are put back to the SET position. .

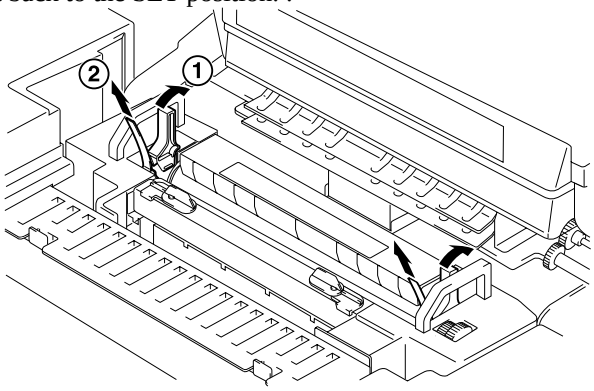


Fig. 2-14 Remove the Protective Parts

2. Install the Oil Bottle into the Fusing Unit with the label side facing the front of the printer. The Oil Bottle is keyed to prevent incorrect installation.

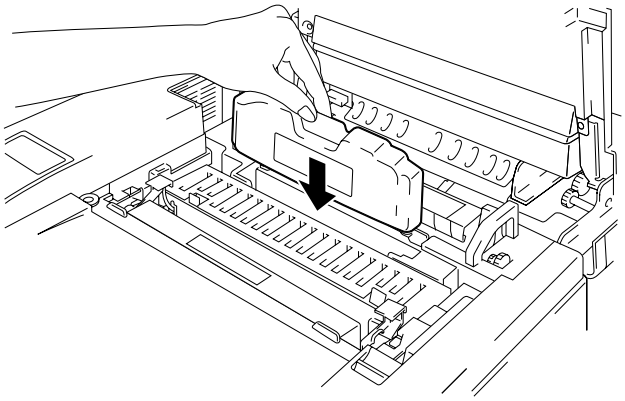


Fig. 2-15 Install the Oil Bottle

> **Caution**
> Do not spill the oil inside the printer. If the oil does spill, it might cause damage to the printer. If you do spill any oil, consult your dealer or our authorized service representative.

3. Place the Fuser Cleaner into the Fusing Unit with the roller side facing you.

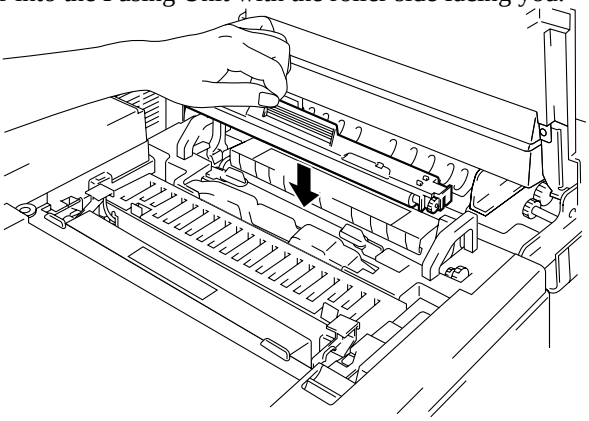


Fig. 2-16 Install the Fuser Cleaner

4. Lock the Oil Bottle and the Fuser Cleaner in place by turning the Oil Bottle Lock Levers.

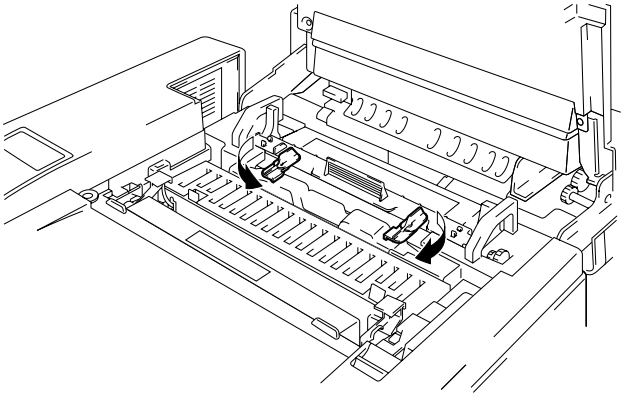


Fig. 2-17 Lock the Oil Bottle Lock Levers

5. Close the Top Cover.

Loading Paper in the Media Cassette

> **Note**
> This printer has a 250 sheet Media Cassette as standard. An additional Lower Tray Unit is available as an option.

Since the Media Cassette supports universal paper types, you can place letter, A4, ISO B5 or Executive size cut sheet paper or COM10, or DL size envelopes in it.
The paper sources have the following limitations. For more information about paper, see "Paper Handling" in Chapter 3.

Paper source	Available sizes	Capacity
Standard Media Cassette	cut sheet : Letter, A4, B5(ISO), B5(JIS), Executive envelope: COM 10, DL OHP film: A4, letter other sizes: width 105-216mm (4.1"-8.5") length 220-297mm (8.7"-11.7")	250 15 50 Up to approx. 250 sheets of 75g/m^2 (20 lbs.) paper
Optional Legal Cassette	cut sheet : Legal, Letter, A4, B5(ISO), B5(JIS), Executive OHP film: A4, letter other sizes: width 105-216mm (4.1"-8.5") length 220-355.6mm (8.7"-14")	250 50 Up to approx. 250 sheets of 75g/m^2 (20 lbs.) paper

> **Note**
> Do not load envelopes in the Optional Legal Cassette. It may cause paper jams.

To install the Media Cassette follow these steps to set the paper guides:

Note

- Be sure to select the same paper size in your application software, or printing errors will occur .
 If your application software does not support paper size selection in its print menu, you can change the paper size with the **Mode** button in the FORMAT MODE. For paper size change information, see "MODE Button" in Chapter 4.
- The default paper size has been factory set to letter or A4, depending upon the final destination of the printer.
 •120V model: Letter size paper set.
 •220/240V model: A4 size paper set.
- Small Size Setting: See "Control Panel" in Chapter 4

Load paper into the Media Cassette as follows:

1. Pull the Media Cassette out of the printer.

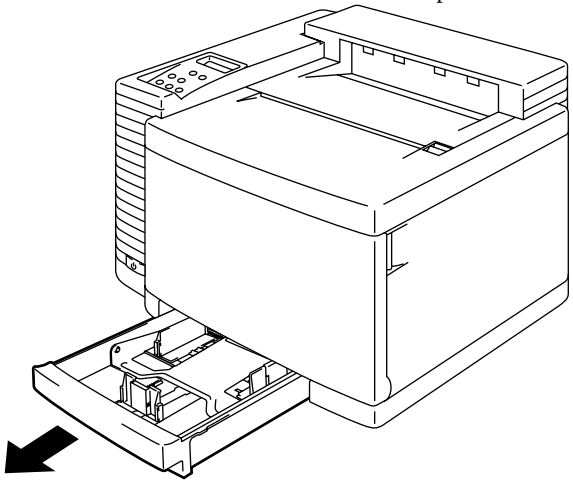


Fig. 2-18 Removing the Media Cassette

2. Adjust the Paper Guides to accommodate the paper size you wish to use. Hold the shaded parts shown below and gently slide the guides into place.

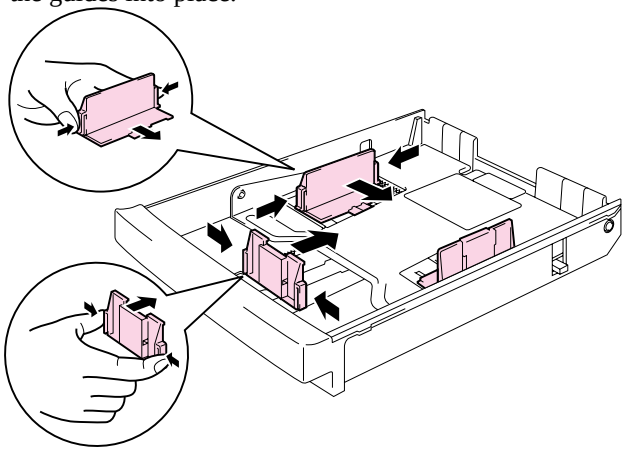


Fig. 2-19 Adjust the Paper Guides

3. Load paper into the Media Cassette.

Note

- Adjust the tray to the correct paper size indication arrow. If you do not adjust it correctly, the printer may detect the wrong size of paper.
- Do not load more than 250 sheets of paper (75 g/m^2or 20 lbs.) in the cassette, or paper jams may occur. Paper (75 g/m^2 or 20 lbs.) should NOT be loaded above the top line on the guide.

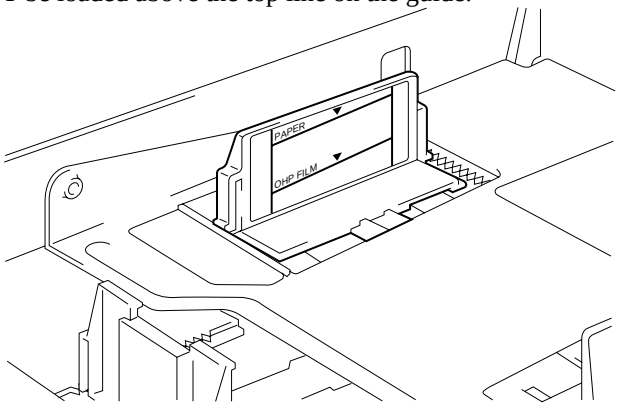


Fig. 2-20 Paper Lines

4. Install the Media Cassette into the printer.

Connecting the Printer to Your Computer

This printer has a bi-directional parallel interface and an RS-232C serial interface. They allow the printer to communicate with IBM/PC® or compatible computers. Before connecting the printer and computer, you need to purchase a connecting cable specifically made for the interface to be used

Since the automatic interface selection mode has been factory set, simply connect the interface cable to the printer. In some cases, you need to turn off the high-speed and bi-directional parallel communications with the **Mode** button. For further information, see "MODE Button" in Chapter 4.

When you use the serial interface, you need to have the same communications settings on both the printer and computer. Since the automatic interface selection mode has been factory set with certain factory settings (baud rate = 9600, code type = 8 bits, parity = none, stop bit = 1, Xon/Xoff = ON, DTR (ER) = ON, and Robust Xon = ON), you may simply connect the interface cable if these are the same as the settings on your computer. When necessary, set the communications parameters with the **Mode** button on the printer. For further information, see "MODE Button" in Chapter 4. For the settings on the computer, see the manual of the computer or software you use.

Connect the printer to your computer as follows:

1. Make sure that both the computer and the printer are turned off.

Caution
Always turn off the printer and computer when connecting and disconnecting the cable.

Note
To use the parallel connection, only a shielded interface cable that is IEEE 1284 compliant and less than 1.8m (6 feet) long should be used.

2. Connect one end of the interface cable to the interface connector located on the back of the printer.

3. Secure the connection to the printer with the wire clips or screws.

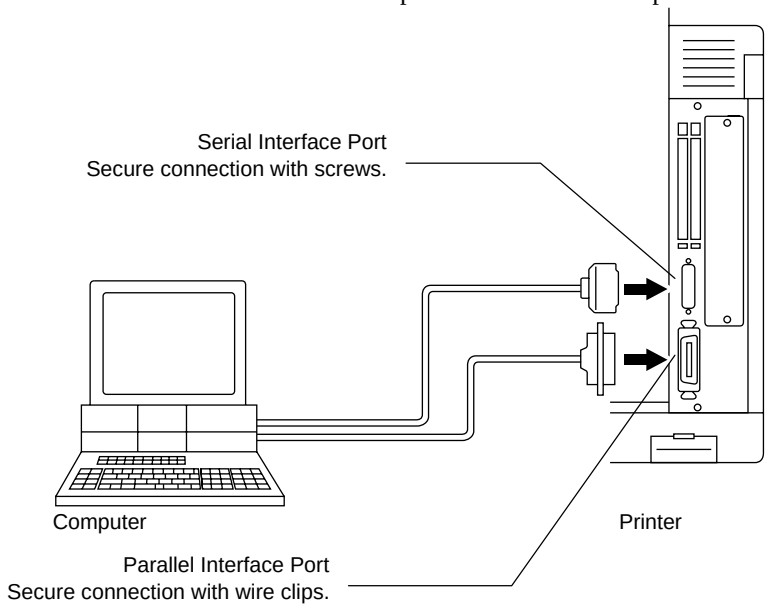


Fig. 2-21 Connecting the Printer and Computer

4. Attach the other end of the interface cable to the interface connector on your computer. Be sure to tighten the connection on the computer as well.

> **Note**
> When you connect to a network, you can use Brother NC-3100h or NC-2010h/NC-2100h Network cards. For the details, refer to the Network User's Guide.

Turning the Printer On

Installing the Power Cord and Turning the Printer On

1. Make sure that the **Power** button is turned OFF. The power button is on the front left side of the printer.

2. Attach the power cord to the printer and plug it into an AC outlet.

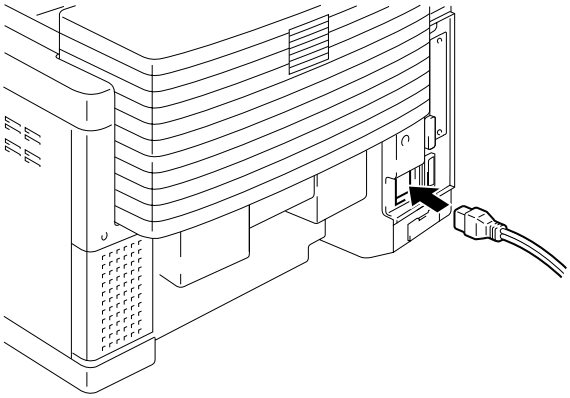


Fig. 2-22 Plugging in the Power Cord

3. Turn the printer on by pressing the **Power** Button.

Caution

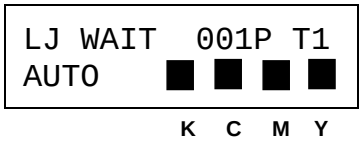
- Check the AC voltage. This printer should be operated at the specified voltage and frequency.
 - USA and Canada: AC 120 V, 50/60 Hz
 - Europe, Australia and others: AC 220 to 240 V, 50/60 Hz
- Since this printer must be electrically grounded, the power cord should be connected to a grounded AC outlet.
- The total length of the power cord, including extension cords, should not exceed 5 meters (16.4 feet). Use of a longer power cord may result in reduced voltage or malfunctions.
- Do not unplug the power cord to turn off the printer.
- The printer should be installed near a power outlet that is easily accessible.

Caution

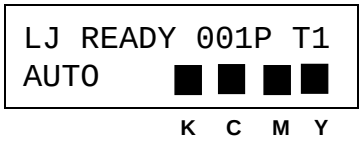
Always wait at least 5 seconds after turning off the power before turning it on again.
Do not turn the power off while the printer is printing as this may cause a paper jam and adversely affect the printer.

The printer performs self-diagnosis at start-up to check its hardware and software. If the printer should find any problems, the display will change to show the corresponding error message. See "TROUBLESHOOTING" in Chapter 6.

The display shows several messages quickly at start-up. If the printer detects no errors, the printer initializes. This will take several minutes during which time the LCD will display the following message :



Once the printer has finished initializing, it automatically goes on-line and the message changes to show the current printer status and settings as shown below:



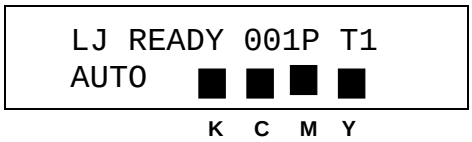
AUTO: The auto emulation selection mode is set.
LJ : The auto emulation selection is set and currently the HP PCL5C emulation is selected.
READY : The printer is ready to print.
001 :The number of copies to print is set to 1.
P : Portrait print is selected.
T1 : Paper is fed from Tray1.
■ : Toner cartridges are full. When the toner cartridges become nearly empty, the ■ indication blinks. The ■ indication disappears when a color toner is empty.

Printing the Test Patterns or Lists

You can check print quality and print a list of available fonts before you actually start working with the printer. To do so, follow these steps:

1. Make sure that you have already installed the toner cartridges, the OPC Belt Cartridge, the Oil Bottle and the Fuser Cleaner and have loaded paper into the cassette. Make sure that you have removed the protective parts on the Waste Toner Pack.

2. Turn on the printer. Wait until the following message is displayed:



3. Press the **Sel** button to set the printer off-line.
 The **On Line** LED goes off.

4. Hold down the **Shift** button and press the **Test** button. Release both buttons.

5. Press the ▲ or ▼ button to scroll through the display until the desired message appears.
 Choose from one of the following selections:

To Print	LCD Message
the Demonstration Page	DEMO PAGE
the Test Pattern	TEST PRINT
the list of printer settings	PRINT CONFIG
the list of internal or resident fonts	PRINT FONTS I
the list of optional card fonts	PRINT FONTS C
the list of permanent download fonts	PRINT FONTS P

To exit from the test mode, select "exit".

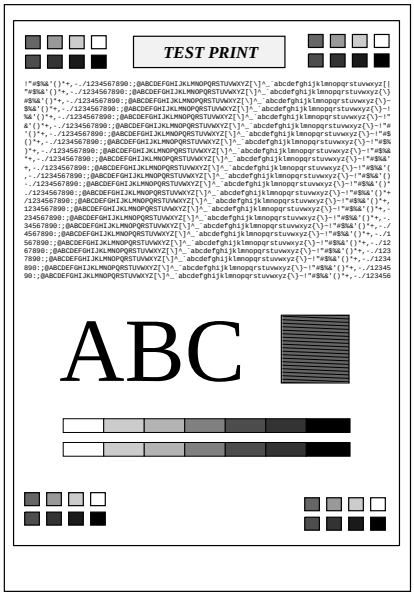
Notes

The messages "PRINT FONTS C" or "PRINT FONTS P" appear only when an optional font card is installed in the font slot or when permanent download fonts are stored in printer memory.

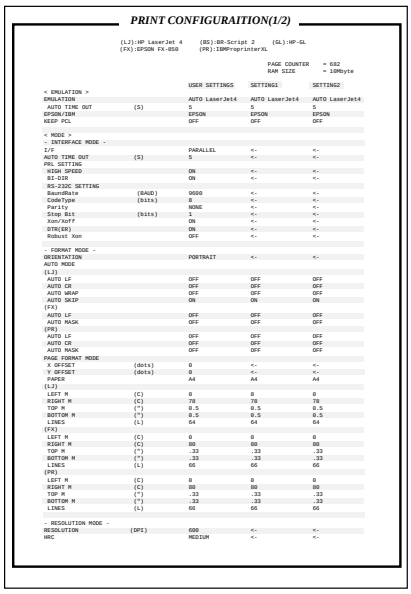
- If the optional font card is installed, you can print a list of optional fonts. Since the list shows the ID numbers specific to each optional font, it helps you select them with the **Font** button. For more information, see "FONT Button" in Chapter 4.
- If user-defined characters are already downloaded into the printer memory as permanent download fonts, you can print a list of them. For more information, see "FONT Button" in Chapter 4.

6. Press the **Set** button.

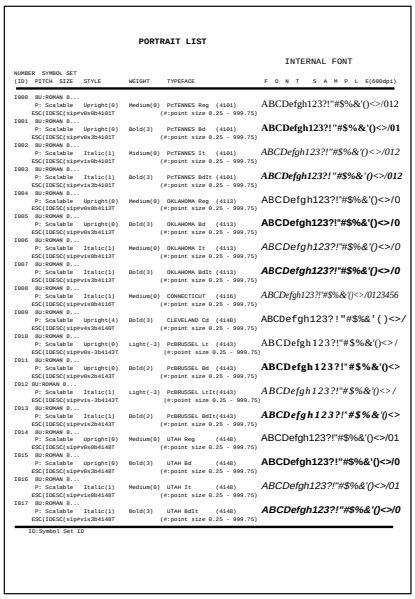
 The printer starts printing the selected test pattern or list. When the printer finishes printing, it automatically returns to the off-line mode. Press the SEL button to set the printer back on-line.



TEST PRINT



PRINT CONFIG



PRINT FONTS I

Fig. 2-23 Test Pattern, Setting List and Font List

*The test pattern, setting list and font list are subject to change without notice.

Install the Printer Driver

Computer Requirements

The following are the minimum computer requirements to setup and operate the printer:

CPU:	80486 or higher (Pentium recommended)
RAM:	8 MB or more for Windows® 95/ 98, 3.1*x* and Windows NT® 4.0 (16 MB or more recommended)
Hard Disk Drive:	10Mbyte free space available for the driver and Fonts (more space is necessary for printing)
OS:	Windows® 95/ 98, 3.1*x* and Windows NT® 4.0

For Windows® 3.1x, 95/98 & Windows NT®4.0 Users

You can set up the printer easily by following the Initial Setup instructions on the supplied CD-ROM.

1. Turn your PC power on and insert the CD-ROM into the CD-ROM drive.

2. The opening screen will appear automatically in Windows® 95/98/WindowsNT ®4.0.

3. If the screen does not appear, click 'Start' and choose 'Run', enter the CD drive letter and type 'START.EXE'.
 If you are using Windows® 3.1*x*, click 'Run' from the 'File Menu' in 'Program Manager', enter the CD drive letter and type 'START.EXE'.

4. Select 'HL-2400Ce series', and then select the language you require and follow the on screen instructions.

5. Click the 'Install Driver & Software', select the printer driver type you want to install and you can install the driver and fonts immediately.

6. After the printer driver has been installed, the HL-2400Ce series window will appear. Follow the onscreen messages to complete the installation.

Notes
- The installer automatically updates your SYSTEM.INI Windows® file by adding DEVICE=bi-di.386 under the [386Enh] section. If any bi-directional parallel communications device driver was installed previously, it will be deactivated by the new driver. If you wish to use old driver, you should re-install it. Re-installing the previous driver will make the new HL-2400Ce driver inactive.
- The installer makes the installed printer driver the Windows® default.
- The installer automatically sets the printer port to the parallel interface, LPT1.
- During this installation, changes have been made to the SYSTEM.INI file. It is necessary to restart Windows® so that the changes become effective and the installed bi-directional parallel communications device driver can take effect.

For Macintosh Users

Note
- The installer for the Macintosh driver works on OS System version 7.5.3 or higher.
- The PPD file can be used in Laser Writer Driver version 8.4.3 or higher.

1. Insert the CD-ROM into your CD-ROM drive.
2. Double click the 'BR-Script PPD Installer' icon.
3. Follow the instructions that appear on the screen.

Notes
For installation of other printer drivers and information on the latest printer drivers see: **http://www.brother.com**

CHAPTER 3
BEFORE WORKING WITH THE PRINTER

AUTOMATIC EMULATION SELECTION

This printer has an automatic emulation selection function. When the printer receives data from the computer, it automatically selects the emulation mode. This function has been factory set to ON.

The printer can select the emulation among the following combinations:

EPSON/IBM Priority	EPSON (default)	IBM
Auto Selection Mode	HP PCL 5C	HP PCL 5C
	BR-Script 2	BR-Script 2
	HP-GL	HP-GL
	EPSON FX-850	IBM Proprinter XL

To get the most out of this laser printer, we recommend you use the Brother BR-Script 2 emulation.

The printer is set to the HP color printer emulation (PCL5C) mode automatically. Since PCL5C mode takes the highest priority in the automatic emulation selection, you can start using the printer as it is with the factory settings in most cases.

When the automatic emulation selection is active, you can check the current emulation on the display. When the printer is in ready, print or wait modes, the display reads as follows:

Emulation	Status Display in Ready State
HP PCL5C	`LJ READY 001P T1`
BR-Script 2	`BS IDLE  001P T1`
HP-GL	`GL READY 001P T1`
EPSON FX-850	`FX READY 001P T1`
IBM Proprinter XL	`PR READY 001P T1`

Notes
Emulation modes other than PCL5C and BR-Script 2 are monochrome emulation modes.

To select the emulation mode manually, use the **Emulation** button. For further information, see “EMULATION Button” in Chapter 4.

Notes

When you use the automatic emulation selection, note the following:

- Once the emulation is automatically changed, it is not changed again for a short period of time. This time period is called "Time Out" and it can be set with the **Emulation** button. The factory setting is 5 seconds.
- The EPSON or IBM emulation mode priority must be selected, since the printer cannot distinguish between them. The factory default setting is EPSON emulation mode. If you wish to use IBM emulation, you will need to select it manually using the **Emulation** button Try this function with your application software or network server. If the function does not work properly, select the required emulation mode manually using the printer panel buttons or use emulation selection commands from your software.

AUTOMATIC INTERFACE SELECTION

This printer has an automatic interface selection function. When the printer receives data from the computer, it automatically selects the bi-directional parallel, RS-232C serial interface, NC-3100h or MIO interface as appropriate.

When you use the parallel interface, you can turn the high-speed and bi-directional parallel communications on or off with the **Mode** button. For more information, see "MODE Button" in Chapter 4. Since the automatic interface selection mode has been factory set to ON, simply connect the interface cable to the printer. (Note: Always turn off both your computer and printer when connecting or disconnecting the cable).

When using the serial interface, you must have the same communication settings on both the printer and computer. Since the automatic interface selection mode has been factory set for standard computer serial link, you may be able to simply connect the interface cable to the printer if your computer already has the settings detailed below:

Communications Parameters	Factory Settings
Baud rate (data transfer speed)	9600
Code type (data length)	8 bits
Parity (data error check)	None
Stop bit (data separator)	1 stop bit
Xon/Xoff (handshake protocol)	ON
DTR (ER)	ON
Robust Xon	OFF

If a commercial interface card has been installed in the MIO card slot, it can be selected automatically.

When necessary, select the interface or the serial communications parameters manually with the **Mode** button (INTERFACE MODE) on the printer. For more information, see "MODE Button" in Chapter 4. For the settings on your the computer, please refer to your user's manual for your computer or application software.

Notes

When you use the automatic interface selection, note the following:

- Once the interface is automatically changed, it is not changed again for a short period of time. This time period is called "Time Out" and it can be set with the **Mode** button. The factory setting is 5 seconds.
- The communications parameters [baud rate, code type, parity, stop bit, Xon/Xoff, DTR(ER), and Robust Xon] must be set for the serial interface. Although they have been factory set as shown in the above table, you may need to change them with the **Mode** button.
- The automatic interface selection function takes a few seconds to work. If you want to speed up printing, select the required interface manually via the **Mode** button.

If you typically use only one interface, we recommend you select that interface as your default.. If only one interface is selected, the printer will allocate all of the input buffer to that interface.

ABOUT THE CONTROL PANEL

Selecting the Local Language Display

The display shows the current printer status. When you operate the control panel buttons, it shows functions and settings. If a problem occurs, it shows the corresponding error message. These messages are displayed in several languages. The default is English.

- English
- German
- Spanish
- French
- Dutch
- Italian

To change to another language:

1. Turn off the printer.

2. Hold down the **Form Feed** button and turn on the printer.

 The message “SELF TEST” appears. Continue holding down the Form Feed button until the message changes to “LANG.=ENGLISH * ”. Release the Form Feed Button

3. Press the ▲ or ▼ button until your desired language appears on the display.

4. Press the **Set** button to make the selected language messages effective.

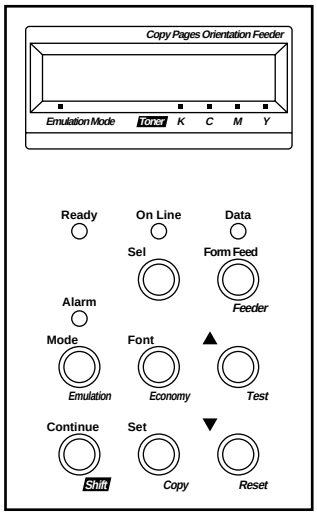
 An asterisk (*) appears at the end of the display for a short time, and then the printer automatically returns to the on-line state with the selected language on the display.

Using the Panel Buttons

The printer has a versatile control panel. It has two operation modes:

When you press the buttons, they work in the NORMAL mode indicated by the function shown above the buttons. When you press the buttons with the **Shift** button held down, they work in the SHIFT mode as indicated by the function shown below the buttons. You can control the basic printer operations and make various printer settings in the NORMAL and SHIFT modes.

For more information, see "BUTTONS IN NORMAL MODE" and "BUTTONS IN SHIFT MODE" in Chapter 4.



Display – Shows various messages.

READY – Lights when the printer is ready to print.
ON LINE – Lights when the printer is in the on-line state.
DATA – Blinks when data is being received and lights when unprinted data remains in printer memory.

SEL – Selects on-line or off-line mode.
FORM FEED – Prints remaining data or reprints the same print job or page.

FEEDER – Selects paper source and media type to be used.

ALARM – Lights if any errors occur.

MODE – Sets functions in various modes.
FONT – Selects font and character set.
▲ (UP) – Scrolls forward through modes and settings.

EMULATION – Selects printer emulation.
ECONOMY – Selects toner save or power save mode.
TEST – Prints self-test pattern or fonts.

CONTINUE – Ignores the error and resumes operation.
SET – Sets selected mode and functions.
▼ (DOWN) – Reverse scroll through modes and settings.

SHIFT – Shifts button operation.
COPY – Sets the number of copies to print.
RESET – Resets printer or restores to factory settings.

Fig. 3-1 Button Operation in NORMAL and SHIFT Modes

> **Note**
> When the printer is used in the BR-Script 2 mode, some buttons are not used.

Printer Settings

There are two types of printer settings available on this printer:

1. User Settings
2. Factory Settings

You can operate the printer with the factory default settings with the control panel settings unchanged. You may change and store personalized settings in the printer memory as user settings.

Remember, User Settings will replace the Factory Default Settings. The new User Settings will remain effective until new settings are made, or the Factory Default Settings are restored.

User Settings

Although the printer settings have been set at the factory, you can change them with the control panel buttons. Your changes will be stored in the printer's memory as "User Settings." They are recalled every time you turn on the printer.

In addition to the current settings, you can save two more sets of User Settings with the **Mode** button and restore them with the **Reset** button. The current settings are cleared after restoring one of the saved user settings.

Factory Settings

The printer settings have been set at the factory before shipment. They are called "Factory Settings." Although you can operate the printer with these factory settings unchanged, you can tailor the printer by making User Settings.

> **Note**
> Changing the User Settings does not affect Factory Settings. You cannot modify the preset Factory Default Settings.

Factory default settings can be restored via the **Reset** button. For more information, see "RESET Button" in Chapter 4.

PAPER HANDLING

Print Media

Paper Size

1. The Standard Media Cassette
Since the Media Cassette is a universal type, you can use any of the paper sizes listed below.. The cassette can hold up to 250 sheets of paper (75 g/m^2 or 20 lbs.) or up to 15 envelopes (paper should be loaded only up to the top line on the sliding guide).

- Plain paper from 105 mm x 220 mm (4.1" x 8.7") to 216 mm x 297 mm (8.5" x 11.7") [Weight = 60 to 160 g/m^2 (16 to 43 lbs)]
- Overhead projector (OHP) films (up to 50 sheets can be loaded)
- Envelopes of COM10, DL size

2. The Optional Legal Cassette
The cassette can hold up to 250 sheets of paper (75 g/m^2 or 20 lbs.). **If you want to print on legal size paper, you must use this cassette.**

- Plain paper from 105 mm x 220 mm (4.1" x 8.7") to 216 mm x 355.6 mm (8.5" x 14") [Weight = 60 to 160 g/m^2 (16 to 43 lbs)]
- Overhead projector (OHP) films (up to 50 sheets can be loaded)
- Envelopes of COM10, DL size

The following are the specifications of paper suitable for this printer.

Item	Recommended paper specification	Xerox 4024	Hammermill Laserprint
Basis Weight (g/m^2)	82±5	75±4	90±4
Thickness (µm)	95±6	102±6	105±6
Smoothness (Bekk)	90±20	35±4	120±20
Stiffness (Clark)	100±15	100±15	90±15
Surface Resistance X10^9(Ω)	10^{10}-10^{11}	10-100	10-100
CIE LAB L*	———	94±2	94±2
CIE LAB a*	———	0.4±1	-0.5±1
CIE LAB b*	———	1.6±1	2.2±1
Brightness (%)	85±2	80±2	85±2
Grain Direction	Long	Long	Long

* Back of paper

paper source	available size and paper type	capacity
Standard Media Cassette	cut sheet : Letter, A4, B5(ISO), B5(JIS), Executive envelope: COM 10, DL OHP film: A4, letter other sizes: width 105-216mm (4.1”-8.5”) length 220-297mm (8.7”-11.7”)	250 15 50 Up to 250 sheets of 75g/m^2 (20 lbs.) paper
Optional Legal Cassette	cut sheet : Legal, Letter, A4, B5(ISO),B5(JIS), Executive OHP film: A4, letter other sizes: width 105-216mm (4.1”-8.5”) length 220-355.6mm (8.7”-14”)	250 50 Up to 250 sheets of 75g/m^2 (20 lbs.) paper

Recommended Paper

The recommended paper type for this printer is:

Xerox 4024 , Hammermill Laserprint or equivalent

Note
- To get the best output quality and to avoid any damage, use smooth white paper.
- We recommend that you test paper, especially special sizes and types of paper, on this printer before purchasing large quantities.
- Print quality will vary depending on the paper being used.

Note
Do not load envelopes in the Paper cassette in the Optional Lower Tray Unit. It may cause paper jams.

Printable Area

The Printable Area depends on the settings in your application. The figure below shows the physically printable area and non guaranteed print area of various paper types with this printer.

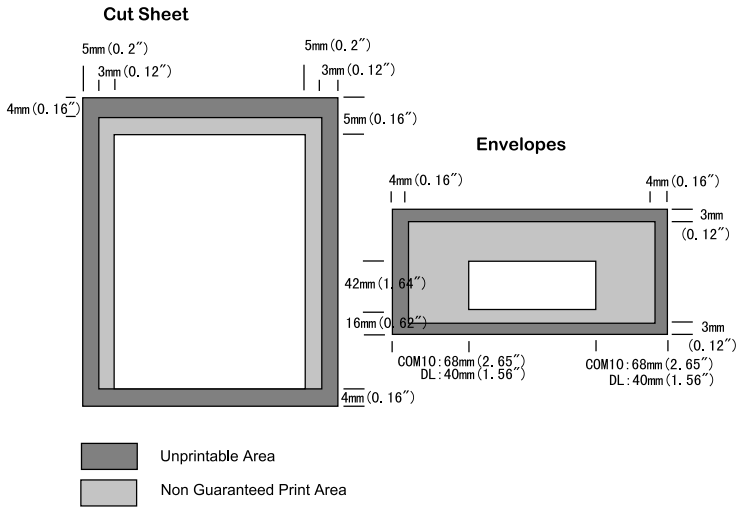


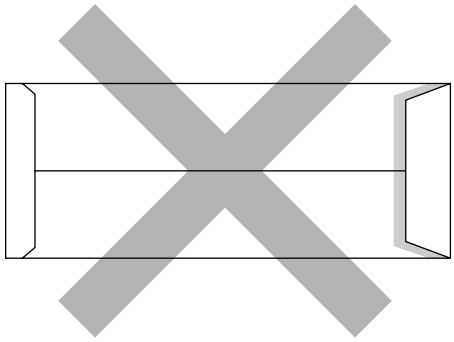
Fig. 3-2 Printable Area and Non Guaranteed Print Area

> **Note**
> If you use paper that does not meet the specifications listed in this User's Guide the life of the various consumables and parts may be reduced.

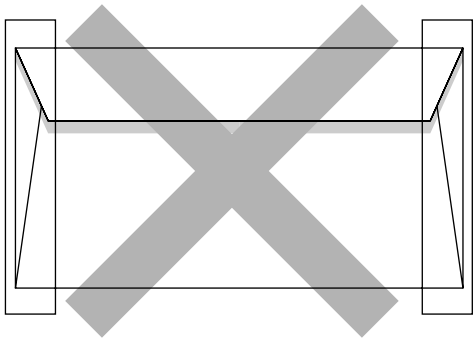
Using Envelopes

Avoid using envelopes with the following characteristics:

- Glossy or shiny surfaces
- Protection cover on the envelopes' adhesive parts
- Sealing flaps that have not been folded at purchase
- Sealing flaps as shown below



- Three or more layers of paper in the marked area



- Each side folded as shown below

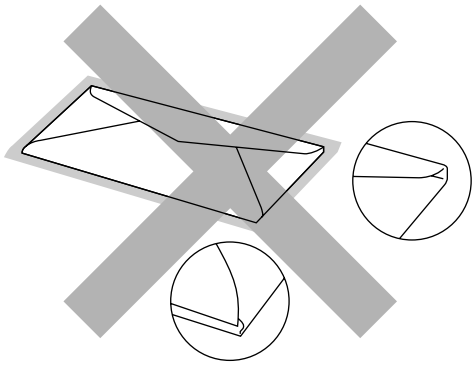


Fig. 3-3 Envelope Information

Before loading envelopes in the cassette, check the following:

- Envelopes should have a lengthwise sealing flap.
- The sealing flaps should be crisply and correctly folded (irregularly cut or folded envelopes may cause paper jams).
- Envelopes should consist of two layers of paper in the following marked area.

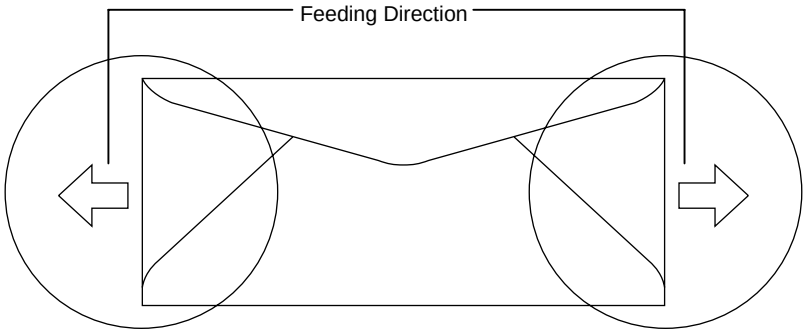


Fig. 3-4 Envelopes

- Envelope joints that are sealed by the manufacturer should be secure.
- All sides should be properly folded without any wrinkles or creases.
- Print quality may vary between different style envelopes. It is a good idea to test the envelopes you wish to use prior to purchasing large quantities.

Cassette Feed

The printer can feed paper from the Media Cassette, Optional Lower Media Cassette or Optional Legal Cassette.

Notes

When you load paper into the Media Cassette, note the following:

- If your application software supports paper size selection on the print menu, you can select it through the software. If your application software does not support it, you can set the paper size with the printer driver or with the **Mode** button on the control panel.
- The paper size has been factory set to letter for 120V models or A4 for 220/240V models. If you want to use other sizes of paper or envelopes, change the paper size in the PAGE FORMAT MODE of the FORMAT MODE with the **Mode** button. For paper size selection, see "MODE Button" in Chapter 4.
- If you use pre-printed paper in the cassettes, please note that the paper should be loaded with the printed side face up and the top edge of the paper at the back of the cassette.

You can set the paper size for the Media Cassette with the **Mode** button in the PAGE FORMAT mode. The printer automatically detects the paper size you set in the Media Cassette. If you load a different size of paper in the Media Cassette from the size selected with the **Mode** button or through your application software, the printer prompts you to load the correct size of paper as follows:

```
T1 LOAD PAPER
**** SIZE
```

(`****` indicates the paper size you have selected with the **Mode** button in the PAGE FORMAT mode or through your application software.)

Manual Feed

Since this printer does not have a manual feed or multi purpose tray, you cannot manually feed irregular sized paper.. However, this printer has a special Manual Feed Mode using Tray 1 (upper tray) to accommodate non-standard paper sizes.

See "Manual Mode" in Chapter 4 for more information on selecting this setting in the printer control panel.

1. When the manual feed command is selected, the printer waits until you load the paper in Tray 1 during manual feed mode operation.

```
T1 MANUAL FEED
**** SIZE
```

2. Pull out Tray 1 and place the paper you are going to use in the tray. It may be necessary to remove some or all of the paper stack first, depending on the size of paper in the tray and the size of the paper you wish to print on manually.

3. Re-install Tray 1 and press the **Continue** button. The printer then starts printing.

Note

- Print quality may be affected by the type of paper you use and the print image.
- You may experience poor paper feeding during Duplex printing.
- This machine is not designed for continuous Duplex printing.
- When you do manual duplex printing, if you leave the printer for more than 5 minutes after you have finished printing the first side, the printer will reset the function automatically.

CHAPTER 4
CONTROL PANEL

DISPLAY AND LEDS

This printer has one liquid crystal display (LCD) and four LEDs on the control panel. The display can show various messages with up to 16 characters in two rows. The LEDs light to indicate the current printer status.

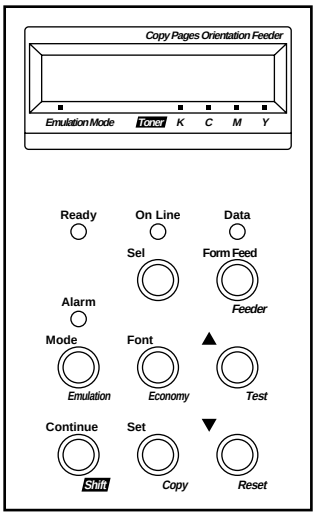


Fig. 4-1 Display and LEDs

Display

The display usually shows the current printer status and emulation mode setting and toner status. When you operate the control panel, you can change settings interactively on the display.

When you take the printer off-line, the display changes to show the currently emulation and informs you that you can change settings in the current emulation.

If any problems occur, the display shows the corresponding operator call, error, or service call message to prompt you to take an action. For more information on these messages, see “TROUBLESHOOTING” in Chapter 6.

Printer Status Messages (on the upper row)

The following table shows the printer status messages that are displayed during normal operation:

Printer Status Message	Meaning
00 READY 001P T1	The printer is ready to print.
00 IDLE 001P T1	The printer is idle. (BR-Script 2 mode only)
AUTO PCL5C	The printer is off-line and currently in HP PCL5C mode under AUTO emulation mode selection.
HP PCL5C	The printer is off-line and in HP PCL5C mode under HP LaserJet emulation mode manual selection.
00 BUSY 001P T1	The printer is busy. (BR-Script 2 mode only)
00 SLEEP 001P T1	The printer is in sleep status (power save mode).
01 PRINT 001P T1	The printer is printing.
01 PR300 001P T1	The printer is printing by decreasing the resolution from 600 dpi to 300 dpi because of insufficient memory.
02 WAIT 001P T1	The printer is warming up.
04 SELF TEST	The printer is performing self-diagnosis.
05 TEST PRINT	The printer is printing the test pattern.
06 DEMO PAGE	The printer is printing the demonstration.
06 PRINT CONFIG	The printer is printing the list of the current printer settings.
06 PRINT FONTS I	The printer is printing the list of the internal or resident fonts.
06 PRINT FONTS C	The printer is printing the list of the optional fonts stored in an installed font card.
06 PRINT FONTS P	The printer is printing the list of the permanent download fonts.
06 DEVICE1 PRINT	The printer is printing the contents of a flash memory card in slot 1.
06 DEVICE2 PRINT	The printer is printing the contents of a flash memory card or HDD card in slot 2.
06 DEVICE3 PRINT	The printer is printing the contents of optional HDD.

Printer Status Message	Meaning*(Continued)*
07 FF PAUSE	The printer has suspended feeding forms. Pressing the **Sel** button resumes form feed.
08 RESET TO USER SETTINGS	The printer is restoring itself to the user settings you selected with the panel buttons. (The message appears only momentarily.)
08 RESET TO SETTING 1	The printer is restoring itself to the user 1 settings. (The message appears only momentarily.)
08 RESET TO SETTING 2	The printer is restoring itself to the user 2 settings. (The message appears only momentarily.)
09 RESET TO FACTORY SETTINGS	The printer is restoring itself to the factory settings. (The message appears only momentarily.)
Now initializing	The printer is initializing the MIO card or initializing the printer for BR-Script 2 emulation.
09 RESET FC ROLLER LIFE	The printer has reset the Fuser Cleaner life counter. Refer to Chapter 5 for details.
09 RESET OPC BELT LIFE	The printer has reset the (OPC) Belt Cartridge life counter. Refer to Chapter 5 for details.
09 RESET FUSER UNIT LIFE	The printer has reset the Fusing Unit life counter. Refer to Chapter 5 for details.
09 RESET 120K KIT LIFE	The printer has reset the 120K Kit life counter. Refer to Chapter 5 for details.

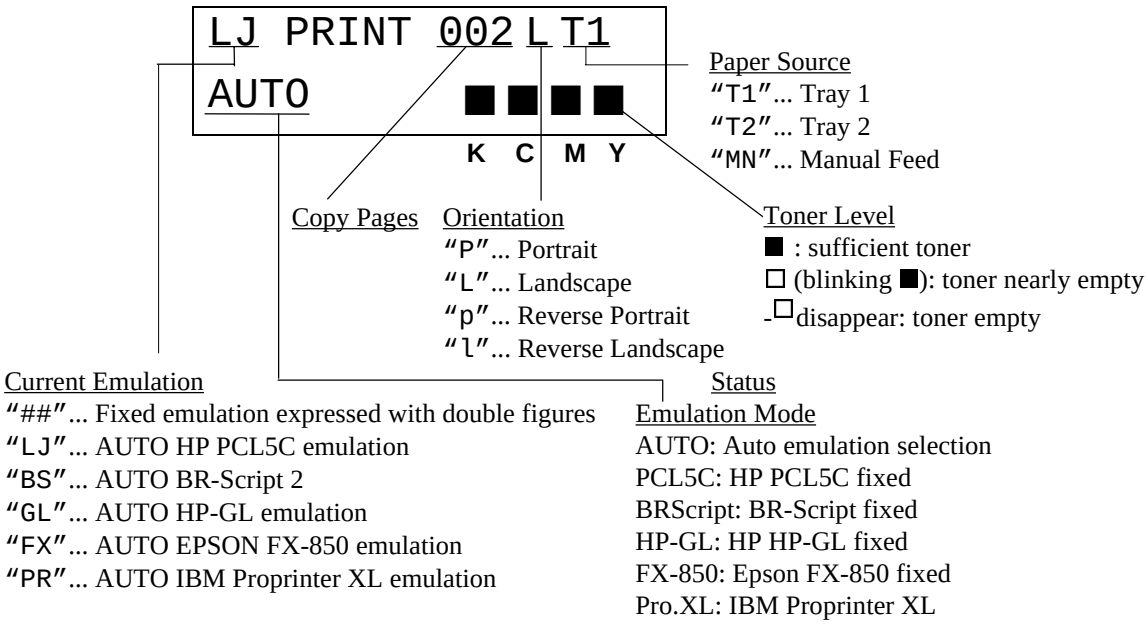


Fig. 4-2 Display

About Routine Maintenance Messages

This printer has some user serviceable parts that require periodic replacement. The printer counts the number of printed pages and detects the life of each of these parts. When the part nears the end of its useful life, the following messages appear on the LCD display. These messages will over-write the Emulation Mode status information.
Refer to Chapter 5 for detailed information on consumables life.

Maintenance Message		Meaning
■ ■ □ ■ K C M Y		When the ■ mark blinks (□), the indicated color toner is nearly empty. K: Black, C: Cyan, M: Magenta, Y: Yellow. When the toner becomes empty the ■ indicator disappears completely.
FUSER OIL LOW		Oil in the Oil Bottle is nearly empty.
REPLACE FCR	*1	Time to replace the Fuser Cleaner.
REPLACE OPC BELT	*1	Time to replace the (OPC) Belt Cartridge.
REPLACE FUSER	*1	Time to replace the Fusing Unit.
REPLACE 120K KIT	*1	Time to replace the Drum Cleaner, the Paper discharger and the Transfer Drum.

*1 - After replacing these parts, you must reset the part life counter. This enables the printer to begin tracking the part life correctly again. See "Maintenance" in Chapter 5.

LEDs

The LEDs light or blink to indicate the current printer status.

READY

LED indication	Meaning
On	Ready to print
Blinking	Warming up

DATA

LED indication	Meaning
On	Data remains in the printer buffer. Pressing the **Form Feed** button prints the data and clears the buffer.
Blinking	Receiving or processing data

ALARM

LED indication	Meaning
On	A problem has occurred in the printer.

ON LINE

LED indication	Meaning
On	The printer is on-line and ready to print
Off	The printer is off-line and stops printing.

BUTTONS IN NORMAL MODE

You can control the basic printer operations and change various printer settings in the NORMAL mode. Functions available in the NORMAL mode are shown above the panel buttons.

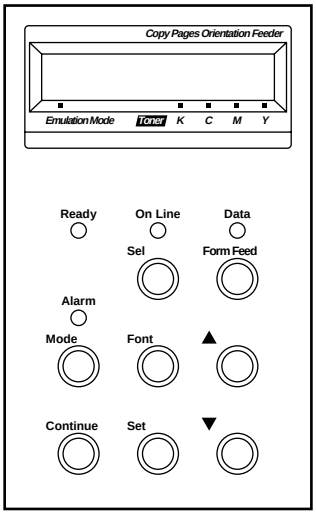


Fig. 4-3 Buttons in NORMAL Mode

> **Note**
> The factory settings are printed in bold in this section.

SEL Button

Pressing the **Sel** button toggles the printer mode between on-line and off-line. When the printer is on-line, the **On Line** LED lights and the printer is ready to receive data from the computer. When the printer is off-line, the **On Line** LED is off.

To receive data from the computer, set the printer on-line. To operate the control panel buttons, set the printer off-line.

If you press the **Sel** button when the printer is on-line, it takes the printer off-line and the LCD displays the current emulation.

You can enter other emulations in the AUTO emulation mode by pressing the ▲ (UP) or ▼ (DOWN) button.

Notes

When you press the **Sel** button, remember the following:

- All other buttons—except the **Sel** button—are operational only when the printer is off-line.
- If the printer is not in AUTO emulation mode, the LCD displays the current emulation by pressing the **Sel** button to take it off-line, but you cannot enter other emulation modes. To make settings in other emulation modes, press the **Emulation** button and select the emulation.
- The **Sel** button works as a "quick exit" button. If you are lost in the display menus or you want to quickly exit the display menu, press the **Sel** button. You can exit quickly from any level of the display menu to the on-line mode. If you have already made a setting effective by pressing the **Set** button and then press the **Sel** button to quickly exit, your setting (whether made by accident or on purpose) will remain effective. Pressing the **Sel** button will not cancel any setting you have made.

SET Button

Pressing the **Set** button allows you to select certain items on the display or make the displayed menu or setting effective. The button also works as an execute button to perform the displayed function.

When you press the **Set** button, the printer stores the settings you have selected into the memory as "User Settings." Every time you turn on the printer, it is reset to these user settings. They remain effective until you make new settings or restore them to the factory settings. For factory reset, see "RESET Button" in this chapter.

Note

When you press the **Set** button to select a setting, for a short time an asterisk appears at the end of the display. Since the asterisk then indicates the current selection, you can easily find the current setting again when you scroll through the display.

▲ (UP) or ▼ (DOWN) Button

Press the ▲ (UP) or ▼ (DOWN) button to scroll forward or backward through the menus and settings. Press or continue pressing the button until you locate your desired option.

MODE Button

Pressing the **Mode** button allows you to enter modes where you can change settings. The mode menus and settings will vary according to the current emulation mode and options.

HP PCL5C, EPSON FX-850, and IBM Proprinter XL Modes	BR-Script Mode	HP-GL Mode
INTERFACE MODE Set interface, parameters.	INTERFACE MODE Set interface, parameters.	INTERFACE MODE Set interface, parameters.
FORMAT MODE Set orientation, paper size, margins, & others.	FORMAT MODE Set horizontal & vertical offsets.	FORMAT MODE Set orientation, paper size, margins, pen setting & others.
RESOLUTION MODE Set resolution & HRC.	RESOLUTION MODE Set resolution & HRC.	RESOLUTION MODE Set resolution & HRC.
PAGE PROTECTION Protect data on a page.	 Not available.	PAGE PROTECTION Protect data on a page.
DEVICE OPERATION Set a flash memory card, a HDD card or optional HDD in HP mode.	DEVICE OPERATION Set a flash memory card, a HDD card or optional HDD in HP mode.	DEVICE OPERATION Set a flash memory card, a HDD card or optional HDD in HP mode.
ADVANCED MODE Set network mode, print density, & others.	ADVANCED MODE Set network mode, print density, & others.	ADVANCED MODE Set network mode, print density, & others.
PAGE COUNTER Show # of printed pages.	PAGE COUNTER Show # of printed pages.	PAGE COUNTER Show # of printed pages.
exit MODE Exit to off-line ready state.	exit MODE Exit to off-line ready state.	exit MODE Exit to off-line ready state.

MODE Button Settings in HP PCL5C, EPSON FX-850, and IBM Proprinter XL Modes

The following table shows all the selections you can choose with the **Mode** button in the HP PCL5C, EPSON FX-850 and IBM Proprinter XL modes.

> **Note**
> The mode menus and settings that appear will vary according to the current emulation mode, printer status and any options that may be installed in the printer.

Mode Menu	Setting Menu	Sub-Setting Menu	Setting
INTERFACE MODE	I/F=PARALLEL	HIGH SPEED=ON	ON or OFF
		BI-DIR=ON	ON or OFF
		exit	Exit to INTERFACE MODE
	I/F=RS-232C	BaudRate= 9600	150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 baud
		CodeType=8 bits	7 or 8 bits
		Parity =NONE	NONE, EVEN, or ODD
		Stop Bit=1 bits	1 or 2 stop bits
		Xon/Xoff=ON	ON or OFF
		DTR (ER)=ON	ON or OFF
		Robust Xon=OFF	ON or OFF
		exit	Exit to INTERFACE MODE
	I/F=EXPAND I/O	Available only when a commercial MIO card has been installed.	
		MIO Setting	The settings available on the installed MIO card can appear under the sub-setting menu.
		Exit	Exit to INTERFACE MODE
	I/F=AUTO	TIME OUT= 5s	1 to 99 seconds
		PRL Setting	Bi-directional settings for AUTO
		HIGH SPEED=ON	ON or OFF
		BI-DIR=ON	ON or OFF
		exit	Exit to PRL Setting
		RS-232C Setting	Parameters for AUTO mode
		BaudRate= 9600	150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200 baud
		CodeType=8 bits	7 or 8 bits
		Parity =NONE	NONE, EVEN, or ODD
		Stop Bit=1 bits	1 or 2 stop bits
		Xon/Xoff=ON	ON or OFF
		DTR (ER)=ON	ON or OFF
		Robust Xon=OFF	ON or OFF
		exit	Exit to RS-232C Setting

Mode Menu (Continued)	Setting Menu	Sub-Setting Menu	Setting
INTERFACE MODE (Continued)	I/F AUTO (Continued)	MIO Setting	Available only when a commercial MIO card has been installed. The settings available on the installed MIO card can appear under the sub-setting menu.
FORMAT MODE	ORIENTATION	ORI=PORTRAIT	PORTRAIT or LANDSCAPE
	AUTO MODE	AUTO LF=OFF	ON … LF + CR OFF … CR only
		AUTO CR=OFF	ON … LF, FF, or VT + CR OFF … LF, FF, or VT only
		AUTO WRAP=OFF	ON … Auto wrap on OFF … Auto wrap off
		AUTO SKIP=ON (HP mode)	ON … Auto FF at bottom margin OFF … No FF at bottom margin
		AUTO MASK=OFF (EPSON & IBM modes)	ON … Auto mask on OFF … Auto mask off
		exit	Exit to AUTO MODE
	PAGE FORMAT MODE	PAPER =LETTER (For 120V model) PAPER =A4 (For 220/240V model)	LETTER, LEGAL, A4, A5, B5, EXECUTIVE, JIS B5, COM10 and DL
		LEFT M = 0C	0 to 126 columns
		RIGHT M = 80C (Letter, Portrait)	10 to 136 columns
		RIGHT M = 78C (A4, Portrait)	10 to 136 columns
		TOP M =0.5" (HP mode)	0, 0.33, 0.5, 1.0, 1.5, or 2.0" (0,8.4, 12.7, 25.4, 38.1 or 50.8 mm)
		BOTTOM M=0.5" (HP mode)	0, 0.33, 0.5, 1.0, 1.5, or 2.0" (0,8.4, 12.7, 25.4, 38.1 or 50.8 mm)
		LINES = 60L (HP, Letter, Portrait)	5 to 128 lines/page
		LINES = 64L (HP, A4, Portrait)	5 to 128 lines/page
		X OFFSET= 0	-500 (left) to +500 (right) dots
		Y OFFSET= 0	-500 (down) to +500 (up) dots
		exit	Exit to PAGE FORMAT MODE
	COLOR MODE	COLOR PRINT = ON	ON...Enable color printing OFF...Monochrome print mode
	exit		Exit to FORMAT MODE
RESOLUTION MODE	RESOLUTION	RESOLUTION	300 or 600 dpi
	HRC SETTING	HRC=MEDIUM	OFF, LIGHT, MEDIUM, or DARK
	exit		Exit to RESOLUTION MODE
PAGE PROTECTION	PROTECT=AUTO		AUTO, OFF, LETTER, A4, or LEGAL
DEVICE OPERATION	When the commercial flash memory card, HDD card or optional HDD has not been formatted:		
(HP mode only)	FORMAT DEVICE		Format the flash memory card, HDD card or optional HDD.
DEVICE1 DEVICE2 DEVICE3 exit			
	Exit		Exit to DEVICE OPERATION

Mode Menu (Continued)	Setting Menu	Sub-Setting Menu	Setting
DEVICE OPERATION	When the commercial flash memory card, HDD card or optional HDD has been formatted:		
(HP mode only)	EXECUTE DATA		Execute the data on the DEVICE.
		DATA ID=#####	Execute the selected data.
		Exit	Exit to EXECUTE DATA
	DEVICE LIST		Print the contents of the DEVICE.
	SAVE	SAVE DATA	Send data to be saved.
		SET KEY--> END	End saving the data.
		DATA ID=#####	Set data ID for saved data.
		SAVE MACRO	Save a macro.
		MACRO ID=#####	Set macro ID for saved macro.
		PRIMARY FONT	Save primary font.
		FONT ID=#####	Set primary font ID for saved font.
		SECONDARY FONT	Save secondary font.
		FONT ID=#####	Set secondary font ID for saved font.
		DOWNLOAD FONT	Save download font.
		FONT ID=#####	Set download font ID for saved font.
		Exit	Exit to DEVICE OPERATION
	DELETE	MACRO ID=#####	Delete the selected macro.
		DATA ID=####	Delete the selected data.
		FONT ID=#####	Delete the selected font.
		FORMAT DEVICE	Format the flash DEVICE.
		SET –> DELETE ALL	Execute formatting the DEVICE.
		Exit	Exit FORMAT DEVICE
	exit		Exit to DEVICEOPERATION

Mode Menu (Continued)	Setting Menu	Sub-Setting Menu	Setting
ADVANCED MODE	NETWORK MODE	LOCK PANEL=OFF	ON or OFF
		PASS NO=###	Enter pass number.
		AUTO FF=OFF	ON or OFF
		WAIT TIME= 5s	1 to 99 seconds for AUTO ON
		FF SUPPRESS=OFF	ON or OFF
		exit	exit to NETWORK MODE
	CONTINUE MODE	CONTINUE=MANUAL	AUTO or MANUAL
	SCALABLE FONT	FONT=ALL	ALL, LJ4
	INPUT BUFFER	❑❑❑❑❑	Increase or decrease the input buffer capacity. (15 levels)
	SAVE SETTINGS	SAVE SETTING 1	Save the current settings as #1
		SAVE SETTING 2	Save the current settings as #2
		exit	exit to SAVE SETTING
	TIME SETTINGS	TIME SETTING	Set time
		YEAR=####	1999 to 2039
		MONTH=##	1 to 12
		DAY=##	1 to 31
		HOUR=##	0 to 23
		MINUTE=##	00 to 59
		TIME STYLE	Set time style displayed
			YY/ MM/ DD hh : mm
			MM/ DD/ YY hh : mm
			DD/ MM/ YY hh : mm
		SUMMER TIME	Set summer time
		SUMMER TIME = ON	ON or OFF
		TIME ZONE	Set time zone
		ZONE SETTING = ON	ON or OFF
		TIME ZONE	-12:00 to +12:00
		exit	exit to TIME SETTINGS
	exit		exit to ADVANCED MODE
PAGE COUNTER	COUNT= 0		Shows the number of printed pages.
MAINTENANCE MODE	REMAIN LIFE	FC=## pages	Shows remaining Cleaner life.
		FU=## pages	Shows remaining Oil life.
		120K=## pages	Shows remaining 120K life.
		BL=## imaegs	Shows remaining OPC life.
	IMAGE COUNTERS	C=##	Shows how many C images printed.
		M=##	Shows how many M images printed.
		Y=##	Shows how many Y images printed.
		K=##	Shows how many K images printed.
		TOTAL=##	Shows how many images printed.
	exit		Exit to MAINTENANCE MODE
exit MODE			Exit MODE.

MODE Button Settings in BR-Script 2 Mode

The following table shows all the selections you can choose with the **Mode** button in the BR-Script 2 mode.

> **Note**
> The mode menus and settings that appear will vary according to the current emulation mode, printer status and any options that may be installed in the printer.

Mode Menu		Setting Menu	Sub-Setting Menu		Setting
INTERFACE MODE Same as HP PCL5C Mode					
FORMAT MODE		PAGE FORMAT MODE	PAPER=LETTER (For 120V model) PAPER=A4 (For 220/240V model)		LETTER, LEGAL, A4, A5, B5, JIS B5, EXECUTIVE, COM10, and DL
			X OFFSET=0		-500 (left) to +500 (right) dots
			Y OFFSET=0		-500 (down) to +500 (up) dots
			exit		Exit to PAGE FORMAT MODE
		COLOR MODE	Same as PCL5C mode		
		exit			Exit to PAGE FORMAT MODE
RESOLUTION MODE		RESOLUTION	RESOLUTION=600		300 or 600 dpi
		CAPT SETTING	CAPT=ON		ON or OFF
		HRC SETTING	HRC=MEDIUM		OFF, LIGHT, MEDIUM, or DARK
		exit			Exit to RESOLUTION MODE
DEVICE OPERATION		When the commercial flash memory card or the HDD card has not been formatted:			
	DEVICE1 DEVICE2 DEVICE3 exit	FORMAT DEVICE			Format the flash memory card, HDD card or optional HDD.
		Exit			Exit to DEVICE OPERATION
DEVICE OPERATION		When the commercial flash memory card, HDD card or optional HDD has been formatted:			
	DEVICE1	EXECUTE DATA			Execute the data on the DEVICE.
	DEVICE2 DEVICE3		DATA ID=#####		Execute the selected data.
		DEVICE LIST			Print the contents of the DEVICE.
		SAVE	SAVE DATA		Send data to be saved.
				SET KEY--> END	End saving the data.
				DATA ID=#####	Set data ID for saved data.
			Exit		Exit to DEVICE OPERATION
		DELETE	MACRO ID=#####		Delete the selected macro.
			DATA ID=####		Delete the selected data.
			FONT ID=#####		Delete the selected font.
			FORMAT DEVICE		Format the DEVICE.
				SET –> DELETE ALL	Execute formatting the DEVICE.
				Exit	Exit FORMAT DEVICE OPERATION
		exit			Exit to DEVICE OPERATION

Mode Menu (Continued)	Setting Menu	Sub-Setting Menu	Setting
ADVANCED MODE	NETWORK MODE	LOCK PANEL=OFF	ON or OFF
		PASS NO=###	Enter pass number.
		AUTO FF=OFF	ON or OFF
		WAIT TIME= 5s	1 to 99 seconds for AUTO ON
		FF SUPPRESS=OFF	ON or OFF
		exit	exit to NETWORK MODE
	ERROR PRINT	ERROR PRINT=OFF	ON or OFF
	CONTINUE MODE	CONTINUE=MANUAL	AUTO or MANUAL
	INPUT BUFFER	❑❑❑❑❑	Increase or decrease the input buffer capacity. (15 levels)
	SAVE SETTINGS	SAVE SETTING 1	Save the current settings as #1
		SAVE SETTING 2	Save the current settings as #2
		exit	exit to SAVE SETTING
	TIME SETTINGS	TIME SETTING	Set time
		YEAR=####	1999 to 2039
		MONTH=##	1 to 12
		DAY=##	1 to 31
		HOUR=##	0 to 23
		MINUTE=##	00 to 59
		TIME STYLE	Set time style displayed
			YY/ MM/ DD hh : mm
			MM/ DD/Y Y hh : mm
			DD/ MM/ YY hh : mm
		SUMMER TIME	Set summer time
		SUMMER TIME = ON	ON or OFF
		TIME ZONE	Set time zone
		ZONE SETTING = ON	ON or OFF
		TIME ZONE	-12:00 to +12:00
		exit	exit to TIME SETTINGS
	exit		exit to ADVANCED MODE
PAGE COUNTER	COUNT=0		Shows the number of printed pages.
MAINTENANCE MODE	REMAIN LIFE	FC=## pages	Shows remaining Cleaner life.
		FU=## pages	Shows remaining Oil life.
		120K=## pages	Shows remaining 120K life.
		BL=## imaegs	Shows remaining OPC life.
	IMAGE COUNTERS	C=##	Shows how many C images printed.
		M=##	Shows how many M images printed.
		Y=##	Shows how many Y images printed.
		K=##	Shows how many K images printed.
		TOTAL=##	Shows how many images printed.
	exit		Exit to MAINTENANCE MODE
exit MODE			Exit MODE

MODE Button Settings in HP-GL Mode

The following table shows all the selections you can choose with the **Mode** button in the HP-GL mode.

> **Note**
> The mode menus and settings that appear will vary according to the current emulation mode, printer status and any options that may be installed in the printer.

Mode Menu	Setting Menu	Sub-Setting Menu	Setting
INTERFACE MODE Same as PCL5C Mode			
FORMAT MODE	PAGE FORMAT MODE	Same as BR-Script mode	
	GRAPHICS MODE	PEN SETTING	
		SETTING=PEN1	PEN1 to 6 (Set size and gray percentage for the selected pen.)
		SIZE #=3 dots	1 to 10 dots (pen size in dots) (# is the selected pen number.)
		GRAY #=100%	15, 30, 45, 75, 90, or 100% (# is the selected pen number.)
		exit	Exit to SETTING=PEN1–6
		exit	Exit to GRAPHICS MODE
		CHARACTER SET	
		STANDARD SET	Standard character set
		ANSI ASCII	See character sets in Appendix .
		ALTERNATE SET	Alternate character set
		ANSI ASCII	See character sets in Appendix. .
		exit	Exit to GRAPHICS MODE
	exit		Exit to FORMAT MODE
RESOLUTION MODE	RESOLUTION	RESOLUTION=600	300 or 600 dpi
	HRC SETTING	HRC=MEDIUM	OFF, LIGHT, MEDIUM, or DARK
	exit		Exit to RESOLUTION MODE

Mode Menu (Continued)	Setting Menu	Sub-Setting Menu	Setting
PAGE PROTECTION	PROTECT=AUTO		AUTO, OFF, LETTER, A4, or LEGAL
	exit		Exit to PAGE PROTECTION
DEVICE OPERATION Same as BR-Script mode			
ADVANCED MODE Same as PCL5C mode			
PAGE COUNTER	COUNT= 0		Shows the number of printed pages.
MAINTENANCE MODE	REMAIN LIFE	FC=## pages	Shows remaining Cleaner life.
		FU=## pages	Shows remaining Oil life.
		120K=## pages	Shows remaining 120K life.
		BL=## imaegs	Shows remaining OPC life.
	IMAGE COUNTERS	C=##	Shows how many C images printed.
		M=##	Shows how many M images printed.
		Y=##	Shows how many Y images printed.
		K=##	Shows how many K images printed.
		TOTAL=##	Shows how many images printed.
	exit		Exit to MAINTENANCE MODE
exit MODE			Exit MODE

Basic Operation Procedures

When you operate the **Mode** button, remember the following basic steps:

1. Press the **Sel** button to take the printer off-line.

2. Press the **Mode** button to enter the MODE menus.

 - Press the ▲ or ▼ button to scroll forward or backward through the menus. (Pressing the **Mode** button allows you to scroll forward.)

 INTERFACE MODE ←▼ or ▲→ FORMAT MODE ←▼ or ▲→ RESOLUTION MODE ←▼ or ▲→ …

 - Press the **Set** button to enter the next lower level of the selected menu.

 Mode Menu —Press SET→ Setting Menu —Press SET→ Sub-Setting Menu

 - Press the ▲ or ▼ button to select the setting on the display.

 I/F=PARALLEL ←▼ or ▲→ I/F=RS-232C ←▼ or ▲→ I/F=OPTION ←▼ or ▲→ …

 - Press the **Set** button to make the selected setting effective.

 When you see “exit” and press the **Set** button, you can exit from the current menu to the next higher level of the menu.

3. Advance to “exit MODE” and press the **Set** button to exit from the mode menus to the off-line ready state.

 Pressing the **Sel** button any time while in any menu level allows you to exit from the menus mode to the on-line state. The selections you made with the **Set** button before exiting are now effective.

Operation Example: Selecting the Parallel Interface

To manually select the parallel interface:

1. Press the **Sel** button to take the printer off-line.
2. Press the **Mode** button and then press the **Set** Button.

 When you enter the interface mode, the display first shows the currently selected interface marked with an asterisk.
3. Press the ▲ or ▼ button until the interface you want appears on the display.

Display Message	Interface Mode
I/F=PARALLEL	Parallel interface
I/F=RS-232C	Serial interface
I/F=EXTEND I/O	Extended I/O interface
I/F=AUTO	**Auto interface selection**

Note
- The Extended I/O interface is available only when a commercial MIO compatible sharing/network card has been installed.
- Some models are supplied with the network card pre-installed.

4. Press the **Set** button to save your selection.

 An asterisk appears at the end of the display for a short time. Then the printer automatically exits from the setting menu to the interface menu.
5. Press the ▲ or ▼ button until the exit menu appears on the display.
6. Press the **Set** button.

 Then the printer automatically returns to the off-line ready state.
7. Press the **Sel** button to turn the printer On-line.

INTERFACE MODE

The automatic interface selection has been factory set. If you want to select a specific interface manually, use interface mode to select it.

Display Message	Interface Mode
I/F=PARALLEL	Parallel interface
I/F=RS-232C	Serial interface
I/F=EXTEND I/O	Extended I/O interface
I/F=AUTO	**Auto interface selection**

Select the setting menu and enter the sub-setting menu to change the setting as follows:

■ Automatic Interface Selection

When you select this function with the **Set** button, the display shows the next sub-setting menu.
You must set the time out for the auto interface selection from 1 to 99 seconds with the ▲ or ▼ button: **factory setting = 5 seconds**. This time out is the duration during which the printer will not allow another automatic change to the interface.
Even if you choose the automatic interface selection, you must set the communications parameters for the serial interface, high speed / bi-directional communications for the parallel interface and the optional interface settings if the installed MIO card requires them. See the tables below.

For more information about automatic interface selection, see "AUTOMATIC INTERFACE SELECTION" in Chapter 3.

■ Parallel Interface

When you use the parallel interface, you must set the communications mode in the following sub-setting menu.

Display Message	High Speed and Bi-directional Parallel Communications
HIGH SPEED=ON	Turn **on** or off the high speed parallel communications.
BI-DIR=ON	Turn **on** or off the bi-directional parallel communications.

The above high-speed and bi-directional settings are used for the bi-directional parallel interface of this printer. The bi-directional parallel interface is compatible with the IEEE 1284 standard. Although it uses the same cable, hardware and software as the bi-directional parallel interface, to use its enhanced capabilities—such as bi-directional communication between the computer and printer and faster transmission of data—you must install the Brother driver supplied on the CD-ROM included with the printer or a third party printer driver or software that supports these features. Check with your software vendor to see if your software supports bi-directional parallel features.

■ Serial Interface

If you intend to use the serial interface, be sure to select the same communications parameters on both the printer and computer. You must also set them for the automatic interface selection.

Display Message	Parameters	Settings
BaudRate= 9600	Baud rate (Data transfer speed)	150, 300, 600, 1200, 2400, 4800, **9600**, 19200, 38400, 57600, 115200 baud
CodeType=8 bits	Code type (Data length)	7 bits or **8 bits**
Parity =NONE	Parity (Data error check)	**None**, even, or odd
Stop Bit=1 bits	Stop bits (Data separator)	**1** or 2
Xon/Xoff=ON	Xon/Xoff (Handshake protocol)	**ON:** DTR & Xon/Xoff handshake OFF: DTR handshake only

Display Message	Parameters	Settings
DTR(ER) =ON (Effective when Xon/Xoff=ON)	Data terminal ready (ER)	**ON:** Makes DTR (ER) low when the buffer is full. OFF: Does not make DTR (ER) low when the buffer is full. DTR(ER) goes low only when the printer is off-line.
Robust Xon =OFF (Effective when Xon/Xoff=ON)	Robust Xon	ON: Sends Xon while waiting. **OFF:** Sends Xon once, when the printer status changes from off-line to on-line.

■ Extended I/O Interface

If you have installed a commercial modular input/output (MIO) card in the printer, you can select the extended I/O interface in this mode. If the installed MIO card requires any optional interface settings, they appear under this menu. Set them, referring to the manual of the MIO card.

> **Note**
> This setting appears only when an MIO card has been installed. For installation of the MIO card, see the Network manual.
> The network card may be pre-installed on some HL-2400Ce series models.

FORMAT MODE

ORIENTATION

When you select "ORIENTATION", you can set portrait or landscape orientation.

> **Note**
> The ORIENTATION selection is effective in the HP PCL5C, EPSON FX-850 and IBM Proprinter XL modes. It does not work in other emulation modes.

This printer can print pages in portrait or landscape orientation. You can check the current orientation on the display.



Fig. 4-4 Page Orientation

When you enter the setting mode, the display first shows the current orientation with an asterisk.
Press the ▲ or ▼ button until the desired orientation appears on the display.

Display Message	Orientation
ORI=PORTRAIT	Portrait
ORI=LANDSCAPE	Landscape

Press the **Set** button to make the displayed selection effective.

An asterisk appears at the end of the display for a short time. Then the printer automatically exits from the setting mode to the FORMAT MODE.

Selection	LCD message on the upper row
portrait	LJ READY 001P T1
landscape	LJ READY 001L T1

AUTO MODE

> **Note**
> The settings in this mode menu are effective in the HP PCL5C, EPSON FX-850 and IBM Proprinter XL modes. They do not appear in other emulation modes.

The page/line termination is set in this mode.

Display Message	Setting	Auto Mode
AUTO LF =OFF	ON	CR → CR+LF
	OFF	CR → CR
AUTO CR =OFF	ON	LF → LF+CR, FF → FF+CR, VT → VT+CR
	OFF	LF → LF, FF → FF, VT → VT
AUTO WRAP =OFF	ON	Line feed and carriage return occur when the printer position reaches the right margin.
	OFF	No line feed and carriage return occur when the printer position reaches the right margin.
AUTO SKIP =ON	ON	Form feed occurs when the printer position reaches the bottom margin.
	OFF	No form feed occurs when the printer position reaches the bottom margin.
AUTO MASK =OFF	ON	The printer ignores the top and bottom margin settings you selected via the control panel. The page length is automatically set to 11” for letter or A4-size paper and to 14” for legal-size paper.
	OFF	The printer operates according to the margin settings you selected via the control panel.

Note on "AUTO MASK"
When you use application software in non-HP modes, be sure to set "AUTO MASK" to ON. When you use letter or A4 size paper, the top and bottom 2 lines are masked and they do not appear on the printout.

The auto modes are subject to the current emulation mode.
O : The auto modes can be set.
X : The auto modes cannot be changed and no setting appears.
— : The auto modes are not available.

	Printer Emulation (Factory settings in bold print)		
AUTO Mode	HP PCL5C	EPSON FX-850	IBM Proprinter XL
AUTO LF	O **OFF**	O **OFF**	O **OFF**
AUTO CR	O **OFF**	X **ON**	O **OFF** (Note)
AUTO WRAP	O **OFF**	X **ON**	X **ON**
AUTO SKIP	O **ON**	—	—
AUTO MASK	—	O **OFF**	O **OFF**

Note
In the IBM emulation mode, FF codes are always followed by a CR code.

PAGE FORMAT MODE

Notes
The settings in this mode menu will vary as follows:
- All settings are effective in the HP PCL5C, EPSON FX-850 and IBM Proprinter XL modes.
- The X and Y (vertical and horizontal) offsets are effective in the BR-Script 2 mode. Other settings are not effective and they do not appear in this mode.
- The paper size and the X and Y (vertical and horizontal) offsets are effective in the HP-GL mode. Other settings are not effective and they do not appear in this mode.

The following settings can be made in this mode:

Display Message	Page Format Mode
PAPER =LETTER	Set cut sheet paper size to **letter**, **A4**, legal, B5, A5 or executive, or envelope size to JIS B5, COM10 or DL.
LEFT M = 0C P	Set the left margin at column **0**-126 at 10cpi.
RIGHT M = 80C P	Set the right margin at column 10-136 at 10cpi. See "List of Factory Settings" in this chapter.
TOP M =0.5" P	Set the top margin at a distance from the top edge of the paper: 0, **0.33 (Non-HP)**, **0.5 (HP)**, 1.0, 1.5, or 2.0 inches.
BOTTOM M=0.5" P	Set the bottom margin at a distance from the bottom edge of the paper: 0, **0.33 (Non-HP)**, **0.5 (HP)**, 1.0, 1.5, or 2.0 inches.
LINES = 60L P	Set the number of lines per page from 5 to 128 lines. See "List of Factory Settings" in this chapter.

The letter "P" in the display messages indicates that the page orientation is portrait. The letter "L" is displayed when it is landscape.

Display Message	Page Format Mode (Continued)
X OFFSET= 0	Move the print start position (at the upper left corner on pages) horizontally up to -500 dots to the left or +500 dots to the right in 300dpi dot unit increments: **factory setting = 0**.
Y OFFSET= 0	Move the print start position (at the upper left corner on pages) vertically up to -500 dots downward or +500 dots upward in 300dpi dot increments: **factory setting = 0**.

Notes

When you choose settings in PAGE FORMAT MODE, note the following:

- Letter size has been factory set for 120V models. A4 size has been factory set for 220/240V models.
- When you use paper smaller than specified in the PAGE FORMAT MODE, be sure that the print area is smaller than the paper size; otherwise the inside of the printer will get stained with toner. We recommend that you perform a test before actual use. For this test, you should use letter or A4 size of paper to confirm that the printed area is completely within the margins of the paper size you intend using. This simple test will help prevent toner from spreading throughout the inside of your printer, which may cause later print jobs to be smudged with toner.
- The factory settings for the right/left margins and lines vary according to the paper size and orientation. See the tables below.
- The top and bottom margins have been factory set to 0.5" in the HP emulation mode and to 0.33" in the non-HP emulation modes.
- The setting margins are subject to the current page orientation. The display shows the current orientation with "P" for portrait and "L" for landscape.
- Images offset outside the print area are not printed.

■ About Right and Left Margins

The settings range of the right and left margins are subject to the page orientation as follows. The right margin should be placed 10 columns greater than the left margin: minimum text width = 10 columns.

If the orientation is changed, the margin settings are restored to the factory settings. If the paper size is changed and the right and left margins exceed the paper size, they are restored to the factory settings: if they do not exceed the paper size, they remain effective.

The following table shows the range of settings in columns. The factory settings are printed in **bold**.

Paper Size	Portrait		Landscape	
	Left Margin	Right Margin	Left Margin	Right Margin
Letter	**0**-70	10-**80**	**0**-96	10-**106**
A4	**0**-70	10-**78**-80	**0**-103	10-**113**
Legal	**0**-70	10-**80**	**0**-126	10-**136**

■ About Line Settings

Setting the number of lines/page automatically sets the line spacing or line feed pitch. If the paper size is changed, the number of lines/page changes accordingly. The new setting is calculated with the following expression and the remainder, if any, is ignored. However, the line feed pitch and the top and bottom margins remain effective.

$$\text{\# of Lines/Page} = \frac{\text{Page Length} - (\text{Top Margin} + \text{Bottom Margin})}{\text{Line Feed Pitch [Vertical Motion Index (VMI)]}}$$

The setting of lines/page is subject to the current paper size and orientation. For example, when letter-sized paper is used, the printer can print 60 lines per page in portrait orientation. If the orientation is changed, the line settings are restored to the factory settings in that orientation.

The following tables show the factory settings in each emulation mode.

In HP Mode

	Orientation	
Size	Portrait	Landscape
Letter	**60 lines**	**45 lines**
A4	**64 lines**	**43 lines**
Legal	**78 lines**	**45 lines**

In Non-HP Modes

	Orientation	
Size	Portrait	Landscape
Letter	**62 lines**	**47 lines**
A4	**66 lines**	**45 lines**
Legal	**80 lines**	**47 lines**

> **Note**
> When you use application software in the non-HP modes, the recommended settings are as follows:
> - Left margin = column 0
> - Right margin = Max. value
> - Auto MASK ON

COLOR MODE

> **Note**
> The settings in this mode menu are effective only in the HP PCL5C and BR-Script 2 modes.

Display Message	Orientation
COLOR PRINT=ON	print in color mode
COLOR PRINT=OFF	print in monochrome mode only

GRAPHICS MODE

> **Note**
> The settings in this mode menu are effective only in the HP-GL mode. They do not appear in any other emulation modes.

Since the HP-GL emulation mode is for a plotter, you can select the plotter pens, the pen size and percentage of gray in this mode menu.

Display Message	Graphics Mode
PEN SETTING	Set the size and percentage of gray separately for six plotter pens.
CHARACTER SET	Set the standard and alternate character sets.

> **Note**
> In most cases, the application software controls the above graphics mode settings, so you do not have to set them in this menu with the **Mode** button. The software or command setting overrides the button setting.

Select the setting menu and enter the sub-setting menu to make the changes as follows:

■ Pen Setting

After you select the pen, advance to the sub-setting menu for size or gray-percentage selection with the ▲ or ▼ button and enter the menu with the **Set** button.

Message appears on the lower row of the LCD	What you can adjust
SIZE 1=3 dots *	The pen size can be set from 1 dot to 10 dots
GRAY 1=100% *	The shades of gray can be set to 15, 30, 45, 75, 90 or 100%

> **Notes**
> - When another pen is selected, the display shows the selected pen with the number after "SIZE' or "GRAY."
> - Whichever resolution you have selected (300 or 600 dpi), the pen size takes effect in units of 300 dpi.

■ Character Set

When you select “CHARACTER SET,” you can select the standard and alternate character sets used in the HP-GL emulation mode.

Enter the sub-setting menu and select the menu for the standard or alternate character set with the ▲ or ▼ button and press the **Set** button.

Character Set	Message on the lower row of the LCD panel
standard character set	STANDARD SET
alternate character set	ALTERNATE SET

Character Sets in HP-GL Emulation Mode
ANSI ASCII (Factory setting)
9825 CHR. SET
FRENCH/GERMAN
SCANDINAVIAN
SPANISH/LATIN
JIS ASCII
ROMAN8 EXT.
ISO IRV
ISO SWEDISH
ISO SWEDISH:N
ISO NORWAY 1
ISO GERMAN
ISO FRENCH
ISO U.K.
ISO ITALIAN
ISO SPANISH
ISO PORTUGUESE
ISO NORWAY 2

RESOLUTION MODE

The print resolution, Color Advanced Photoscale Technology (CAPT) and High Resolution Control (HRC) can be set in this mode menu.

Display Message	Resolution Mode
RESOLUTION	Set the print resolution of the printer.
CAPT SETTING	Set the CAPT function. .
HRC SETTING	Set the HRC function.

Select the setting menu and enter the sub-setting menu to make the settings as follows:

■ Resolution

When you select "RESOLUTION," you can choose a resolution of 300 or 600 dots per inch (dpi) on this printer. You can set the resolution in this mode according to your requirements.

The printer may not be able to print large files because of the resolution and the printer's memory. The higher the resolution (and thus the file size), the more memory is required.

Display Message	Resolution
RESOLUTION=600	Set the resolution to 600 dpi. **(Factory setting)**
RESOLUTION=300	Set the resolution to 300 dpi.

Note

- Even if you set the resolution to 600 dpi in this mode, the printer may not be able to print large and complex full color files at 600 dpi because of insufficient memory. However, it automatically decreases the resolution to 300 dpi to print them. While the printer is printing in this mode, the display prompts "01 PR300 … ."
- If the printer cannot print files even at 300 dpi, a "MEMORY FULL" error occurs. See "TROUBLESHOOTING" in Chapter 6.
- This automatic resolution decrease function works with the page protection on. See also "PAGE PROTECTION" in this chapter.
- When you want to print large and complex full color data without decreasing the resolution, you should expand the memory capacity of the printer.

■ CAPT Setting

When you select "CAPT SETTING," you can use the Color Advanced Photoscale Technology (CAPT) function which offers photographic fine color on graphics. CAPT setting is available only in BR-Script 2 mode. This feature requires a minimum of 24 MB of RAM to process large and complex full color printouts. When you set CAPT=ON, the high resolution control (HRC) setting is unavailable.

Display Message	Advanced Photoscale Technology
CAPT =ON	Color advanced photoscale technology is effective.
CAPT =OFF	Cancel the color advanced photoscale technology. **(factory setting)**

Note

In the PCL 5C mode, CAPT setting is always ON. It depends on the printer setting if the printer uses the function or not.

■ HRC Setting

When you select "HRC SETTING," you can set the high resolution control (HRC) function which is a special function that offers improved print quality of characters and graphics that conventional laser printers cannot attain with resolutions of 300 or 600 dpi.

Display Message	High Resolution Control
HRC =OFF	Cancel high resolution control.
HRC =LIGHT	Set high resolution control to the light level.
HRC =MEDIUM	Set high resolution control to the medium level. **(Factory setting)**
HRC =DARK	Set high resolution control to the dark level.

The following figures show jagged print with the high resolution control set to "OFF" on the left and clear and crisp print with the control set to "MEDIUM" on the right.

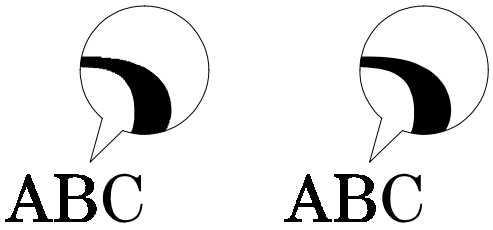


Fig. 4-5 High Resolution Control

The high resolution control has been factory set to "MEDIUM." The "LIGHT" or "DARK" setting might be better depending on the selected print density. Choose the best setting for clear and crisp printouts.

To check the printout with the high resolution control, perform the test print with the **Test** button. For operation information, see "TEST Button."
Lines in the test pattern are smoother if the high resolution control is set to LIGHT, MEDIUM, or DARK. Choose an HRC setting and perform the test print so that stepped lines become unnoticeable.

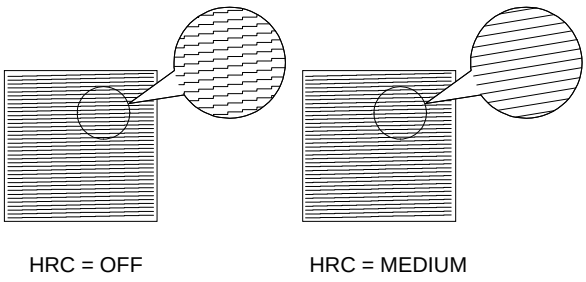


Fig. 4-6 High Resolution Control in Test Printout

PAGE PROTECTION

> **Note**
> The setting in this mode menu is effective in the HP PCL5C, EPSON FX-850, IBM Proprinter XL and HP-GL modes. It does not appear in the BR-Script 2 mode.

If print images are too complex to print, the printer may print them in parts or only on part of the page. If this occurs, the printer loses print data and shows a message on the LCD panel.

The page protection function reserves additional memory so that the printer can create the entire page image in memory before physically printing it. This function can be set for letter, A4, or legal size paper. Select the paper size for page protection.

Display Message	Page Protection
PROTECT=AUTO	Page protection on only when it is necessary. **(Factory setting)**
PROTECT=LETTER	Page protection on for letter size paper.
PROTECT=A4	Page protection on for A4 size paper.
PROTECT=LEGAL	Page protection on for legal size paper.
PROTECT=OFF	Page protection off

To protect pages, your printer will need the minimum memory shown in the following table:

Protection	600 dpi Color
Off	16 Mbytes
Letter or A4	20 Mbytes
Legal	24 Mbytes

> **Note**
> When you use the page protection function, note the following:
> - If the function setting is changed, all download fonts and macros—including permanent ones—are cleared. If the memory is too low to protect pages, page protection does not take effect.

DEVICE OPERATION

Notes

- BE SURE TO TURN OFF THE PRINTER POWER BUTTON BEFORE INSTALLING OR REMOVING A FLASH MEMORY CARD OR HDD CARD, OR THE CARD WILL BE DAMAGED.
- Settings in this mode are effective only when you have installed a flash memory card, HDD card or optional HDD and you have selected PCL5C, HP-GL, or BR-Script 2. They will not appear if the printer does not have a card installed or if it is in another emulation mode.
- If you turn the printer off or remove the flash memory card or HDD card while data is being written onto or deleted from the card, all the data on the card may be lost.
- If the write protect button of the flash memory card or HDD card is on, this mode menu does not appear.
- An HDD card will only fit into slot 2.

Be sure to install a commercial flash memory card or HDD card in the correct card slot of the printer.

When you are in this mode menu, you can save macros and fonts in the installed flash memory card or the HDD card.

The sub-setting menus displayed in this mode will vary according to the status of the installed card.

Display Message	Card Operation
DEVICE 1	Select Card 1.
DEVICE 2	Select Card 2.
DEVICE 3	Select optional HDD.

When two cards are installed, you can select the card that you want to operate.

When the installed card is not formatted:

When you enter this mode menu with a flash memory card, HDD card or optional HDD installed but not formatted by this printer, you must first format the device.

If DEVICE is selected,

Display Message	Card Operation
FORMAT DEVICE	Format a new flash memory card, HDD card or optional HDD.
Exit	Exit to DEVICE OPERATION

When the display shows "FORMAT DEVICE," press the **Set** button to format the installed card.

After the printer finishes formatting the device, you must exit to the "DEVICE OPERATION" menu.

Notes
- When the card is formatted, data that was previously written is erased.
- It takes ten or more seconds to format a 2-Mbyte flash memory card, HDD card or optional HDD. The larger the capacity of the device, the longer time it takes to format.

When the installed flash memory card, HDD card or optional HDD is formatted:

When you enter this mode menu with a formatted device installed, the display shows the following menus:

Display Message	Card Operation
DEVICE 1	Select Card 1.
DEVICE 2	Select Card 2.
DEVICE 3	Select optional HDD.

After you have selected the card, the display shows the following messages:

Display Message	Flash Operation
EXECUTE DATA	Select the data ID and execute the selected data. This menu appears only when data has been saved on the card.
DEVICE LIST	Print the contents of the flash memory, HDD card or optional HDD. This menu appears only when something has been saved in the device.
SAVE	Save received data, macros and fonts.
DELETE	Delete items from the device.

> **Note**
> A common use of the flash memory is with FORMS software packages. With these commercially available software packages you have an option to send a form to the printer without any data. After you have sent the form to the printer, you may save the form in the flash memory as a Macro. Then the next time you want to print this form, you would setup your FORMS software package to SEND DATA ONLY - USE FORM IN PRINTER. This process could save from 1 to 4 minutes per print job.

Select the setting menu and enter the sub-setting menu to change the settings as follows:

■ Execute Data

> **Note**
> This menu appears only when data has been saved on the device.

When you select "EXECUTE DATA," you can execute any of the data saved in the device using the SAVE DATA mode.

When you enter this sub-setting menu with the **Set** button, the printer prompts you to select the ID of the data.
Select the ID with the ▲ or ▼ button and press the **Set** button again, so that the printer executes the selected data.

■ Device List

When you select "DEVICE LIST" and you press the **Set** button, the printer automatically loads paper and starts printing the contents of the installed flash memory card, HDD card or optional HDD. You can check the contents and the unused capacity of the device.

■ Save

When you select “SAVE” and you press the **Set** button, you can enter the following sub-setting menus to save the macros and fonts in the installed device:

Display Message	Save Menu
SAVE DATA	Save data that the printer will receive and set its ID.
SAVE MACRO	Save a macro. This menu appears only in the HP PCL5C emulation mode.
PRIMARY FONT	Save the primary font selected with the **Font** button. This menu appears only in the HP PCL5C emulation mode.
SECONDARY FONT	Save the secondary font selected with the **Font** button. This menu appears only in the HP PCL5C emulation mode.
DOWNLOAD FONT	Save a download font. This menu appears only in the HP PCL5C emulation mode.

Note
If the capacity of the device becomes low while macros and fonts are being saved, the display shows the “DEVICE FULL” error message and they cannot be saved. Use a new device or delete unnecessary macros and fonts from the card. The DEVICE LIST displays the contents and the used capacity.

• Save Data

You can send data and save it on the device. In this mode, any kind of data such as PCL data, BR-Script 2 data and command strings can be saved. When you select “SAVE DATA” and you press the **Set** button, the display shows the guide menu.
The guide menu message prompts you to press the **Set** button again so that the printer exits from the data reception status when you have finished sending data.

Send the data from your computer and then press the **Set** button.

Notes
When you send data to be saved on the card, it is temporarily stored in the RAM of the printer. Note the following:
- If the received data exceeds the RAM capacity, a memory full error occurs. You can clear this error with the **Continue** button. When this error occurs, only part of the image has been stored in RAM, therefore, you cannot save the data to the card.
- The printer is reset to ensure as much capacity as possible is available in RAM. If any data remains, it will be printed first.

After you have finished sending data, press the **Set** button again, so that the printer exits from the data reception status.

When you exit from the data reception status, select the data ID with the ▲ or ▼ button and press the **Set** button. The printer will then save the received data with the selected ID onto the card.

Notes
- When you see an asterisk on the display, the ID number has been used for other data or a macro. If you select the used ID number, the old data or macro is erased and replaced with the new data.
- Once the data is saved, you can execute it with "EXECUTE DATA" or with a data execution command.
- The data saved in the SAVE DATA mode cannot be run with a macro execution command in HP PCL5C emulation.

• Save Macro

Note
The "SAVE MACRO" menu appears only in the HP PCL5C emulation mode.

If you have downloaded a macro into the printer's memory, you can save the macro on the installed flash memory card or HDD card.

If a macro has been downloaded into the printer's memory and you press the **Set** button at "SAVE MACRO", the printer prompts you to select the ID for the macro.

Select the ID with the ▲ or ▼ button and press the **Set** button again, so that the printer saves the macro with the selected ID.

> **Note**
> When you see an asterisk on the display, the ID number has been used for another macro or data. If you select the used ID number, the old macro or data is erased and replaced with the new macro.

You can execute a macro with the macro execution command.

• Primary Font or Secondary Font

> **Note**
> The “PRIMARY FONT” and “SECONDARY FONT” menus appear only in the HP PCL5C emulation mode.

If you have selected the primary or secondary font with the **Font** button, you can save the font on the installed flash memory card or HDD card.

When you press the **Set** button at the “PRIMARY FONT” or “SECONDARY FONT” message, the printer prompts you to select the ID of the font.
Select the ID with the ▲ or ▼ button and press the **Set** button again, so that the printer saves the font with the selected ID.

> **Note**
> When you see an asterisk on the display, the ID number has been used for another font. If you select the used ID number, the old font will be erased and replaced with the new one.

Whatever font you have selected via the **Font** button, the printer will save it as a bitmapped font as long as the print size is no more than 24 point. This allows the printer to print fonts faster than when they are not saved. We recommend that you save the scalable fonts that you frequently use as bitmap fonts for faster printing.

Since the flash memory card is in card slot 1 or 2 (the HDD card can only be used in card slot 2), fonts stored in the card behave in the same way as they would if they were in a dedicated Font Card. You can select the saved fonts as “DEVICE1 FONT” or “DEVICE2 FONT” with the **Font** button or the font selection command from your software. For font selection, see “FONT Button” in this chapter.

You can check the saved fonts by printing the list of fonts with the **Test** button. See “TEST Button” in this chapter.

Notes
When you save the primary or secondary font, note the following:
- The font is temporarily stored in the RAM of the printer before it is saved on the device. If the font data exceeds the RAM capacity, a memory full error occurs. You can clear this error with the **Continue** button. As not all the font data has been stored in RAM, you cannot save the font to the device. When the font data is saved, the printer is reset to ensure as much capacity as possible in RAM. If any data remains, it is printed.
- If you have saved the font at 600-dpi resolution and change the printer resolution to 300 dpi, the printer cannot print the saved font.

• Download Font

Notes
- The "DOWNLOAD FONT" menu appears only in the HP PCL5C emulation mode.
- Be sure to print the list of download fonts with the **Test** button and check the download font ID on the list before you enter this menu. You must select the font in this menu using the same number you see on the list.

If you have downloaded a font into the printer memory, you can save it on the flash memory card, HDD card or optional HDD.

The printer prompts you to select the download font ID that you can choose from the font list. Press the ▲ or ▼ button to move the cursor to the ID and select it with the **Set** button.

Note
The download font IDs do not appear when fonts have not been downloaded.

After you have selected the download font ID, press the **Set** button, so that the printer saves the selected download font. Vector or bitmapped fonts are saved in the format of the original font.

Once you save the downloaded font in the device, you will not need to download the font every time you want to use it.

Since the font can be saved in either the flash memory card in card slot 1 or 2 (the HDD card can be used only in card slot 2) of the printer, or in the optional HDD, you can select the saved fonts as "DEVICE1(2 or 3) FONT" with the Font button or the font selection command from your software. For font selection, see "FONT Button" in this chapter.

You can check the fonts saved on the card by printing the list of fonts with the **Test** button. See "TEST Button" in this chapter.

> **Note**
> When the fonts on the HDD card are selected in a print job, they are copied into the printer RAM. It may cause a printer memory full error because those fonts occupy some RAM space. We recommend that you install optional DIMM memory to use the downloaded fonts on the HDD card.

■ Delete

When you select "DELETE" and press the **Set** button, you can enter the following sub-setting menus to delete macros and fonts or format the installed flash memory card or HDD card:

Display Message	Delete Menu
MACRO ID=#####	Delete the selected ID macro.
DATA ID=#####	Delete the selected ID data.
FONT ID=#####	Delete the selected ID font.
FORMAT DEVICE	Format the flash memory card, HDD card or optional HDD.

• Macro

When you press the **Set** button at "MACRO ID=#####," the cursor moves to the ID number. The printer prompts you to select the ID number of the macro to be deleted.
Select the ID number with the ▲ or ▼ button and press the **Set** button, so the printer deletes the selected macro.

• Data

When you press the **Set** button at "DATA ID=#####," the cursor moves to the ID number. The printer prompts you to select the ID number of the data to be deleted.
Select the ID number with the ▲ or ▼ button and press the **Set** button, so the printer deletes the selected data.

• Font

When you press the **Set** button at "FONT ID=#####," the cursor moves to the ID number. The printer prompts you to select the ID number of the font to be deleted.
Select the ID number with the ▲ or ▼ button and press the **Set** button, so the printer deletes the selected font.

• Format Device

You can format the flash memory card, HDD card or optional HDD to delete its contents. Instructions are in the following menu:

```
FORMAT DEVICE
```

When you press the **Set** button in this menu, the printer asks if you want to delete all contents of the device. Then press the **Set** button to start formatting the device.

When you want to cancel formatting, move to the next menu with the ▲ or ▼ button and press the **Set** button.

ADVANCED MODE

NETWORK MODE

Display Message	Network Mode
LOCK PANEL=OFF	Turns on or **off** lock panel function.
AUTO FF=ON	Turns **on** or off auto form feed.
FF SUPPRESS=OFF	Turns on or **off** the form feed suppress function.

■ Lock panel

If someone other than you has changed the control panel settings and you do not know about it, the printer may not print as expected or it may not print at all.
To address this problem, lock or unlock the control panel as follows:

Display Message	Lock Panel
LOCK=OFF	Unlock the panel buttons of the printer. **(Factory setting)**
LOCK=ON	Lock the panel buttons of the printer.

Even if the control panel is locked, you can still use the **Sel**, **Form Feed**, **Copy**, **Continue**, **Reset** and **Test** buttons for their standard functions. You can only check the settings of the other buttons, you cannot make changes to them.. To change these settings you must first unlock the control panel.

To lock or unlock the control panel, you must enter a 3-digit pass number.
The default setting is OFF. To turn on the lock feature, select the ON setting and press Set. Change the first digit of the number with the ▲ or ▼ button and move to the next digit with the **Set** button. After you finish entering your 3-digit pass number, the control panel buttons are now locked. To unlock the settings, change the Lock setting to OFF on the control panel and then enter the 3 digit code you previously entered. Correct entry is required for the setting to be unlocked.

> **Note**
> Do not forget the pass number used to lock the control panel. If you enter the wrong number, you will not be able to unlock it and the display will show the following message:
>
> INCORRECT!!

■ Auto Form Feed

If unprinted data remains in the printer's memory, the **Data** LED stays on. You must print the remaining data with the **Form Feed** button. See "FORM FEED Button" in this chapter.

The auto form feed mode you can set in this menu allows you to print the remaining data without pressing the **Form Feed** button.

You can turn the auto form feed mode on or off in this menu as follows:

Display Message	Auto Form Feed
AUTO FF=OFF	Turn off the auto form feed. You must press the **Form Feed** button every time data remains in the printer's memory. **(Factory setting)**
AUTO FF=ON	Turn on the auto form feed. Every time data remains in the printer's memory, an auto form feed takes place after the wait time set as shown below.

When you turn on the auto form feed feature as explained above, you must set the wait time in the following sub-setting menu:

Display Message	Wait Time
WAIT TIME= 1s . . WAIT TIME=99s	Set the wait time for the auto form feed. The printer automatically prints the remaining data after the set wait time. The wait time can be set from 1 to 99 seconds.

■ Form Feed Suppress

You can turn the form feed suppress function on or off in this menu as follows:

Display Message	Form Feed Suppress
FF SUPPRESS=OFF	Turn off the form feed suppress function. **(Factory setting)**
FF SUPPRESS=ON	Turn on the form feed suppress function.

If pages contain no print data, the printer would normally print blank pages. When you turn this function on, you can suppress printing blank pages.

When the printer is used in a network environment, it may be set to deliberately print a blank page at the end of each print job. When you turn on this function, the printer does not print the blank pages.

ERROR PRINT

> **Note**
> The setting in this mode menu is effective only in the BR-Script 2 mode. It does not appear in any other emulation modes.

You can turn on or off the error print in this mode.

Display Message	Error Mode
ERROR PRINT=ON	Turn on the error print so that the printer prints a Postscript error if one occurs.
ERROR PRINT=OFF	Turn off the error print so that the printer does not print an error message. (**Factory setting**)

CONTINUE MODE

If any recoverable error occurs, including "Toner Empty," it can be cleared with the **Continue** button. The **Continue** button function is selected with this mode setting.

Display Message	Continue Mode
CONTINUE=MANUAL	Select the manual error recovery mode. Press the **Continue** button to clear errors. (**Factory setting**)
CONTINUE=AUTO	Select the auto error recovery mode. The printer automatically clears recoverable errors. You need not press the **Continue** button.

SCALABLE FONT

> **Note**
> The setting in this mode menu is effective only in the HP PCL5C mode. It does not appear in any other emulation modes.

Since this printer has many scalable fonts, some application programs may not be able to handle them correctly. When the HP PCL5C emulation mode has been selected, the printer may print a different font rather than the font you have selected with your program or a font selection command.

To cope with this font problem, you can restrict the font selection by using this setting as follows:

Display Message	Scalable Font
FONT=ALL	All scalable fonts for this printer can be selected with the font selection command. **(Factory setting)**
FONT=LJ	Scalable fonts for this printer other than the following can be selected with the font selection command: Atlanta, Bermuda Script, PC Brussels, Copenhagen, Germany, Portugal, Calgary, San Diego, and US Roman.

Even if you restrict the font selection as above, you can select among all the scalable fonts with the **Font** button. The setting in this mode menu merely restricts the font selection command from an application to avoid incorrect font selections.

INPUT BUFFER

You can increase or decrease the capacity of the input buffer with the ▲ or ▼ button in this mode menu. A larger capacity allows the printer to receive data from the computer faster.

> **Note**
> If the printer reports a memory full error, reduce the capacity of the input buffer.

Display Message	Input Buffer
❑❑❑❑❑❑❑❑❑❑❑❑❑❑❑ ❑❑❑❑❑❑❑❑❑❑❑❑❑❑❑ : :	The more squares, the larger the capacity of the input buffer. The squares indicate the capacity but not the size in Mbytes since this depends on the total memory installed in the printer.
❑❑	The capacity can be set to 15 levels.
❑	**(Factory setting =❑❑❑❑❑)**

After you change the input buffer capacity (make sure you press the **Set** button), be sure to turn off the printer and then turn it on again. The setting takes effect when you turn the printer back on.

> **Notes**
> - The set capacity is not changed even if the emulation mode is changed.
> - The actual capacity of the input buffer varies according to the installed RAM. If the RAM capacity is small, the input buffer capacity may not be increased.

Installed memory	16M	32M	112M
1 square	30KB	30KB	30KB
5 squares	0.9MB	4.3MB	21.4MB
15 squares	3.0MB	15.0MB	75.0MB

The Input buffer size increases proportionally .

Fig. 4-7 Input buffer size

SAVE SETTINGS

Suppose you share this printer with others who want different control panel settings.
Since more than one set of user settings can be stored in the printer's memory, you can easily reset the printer to your preferred settings after they are changed. For resetting the printer, see "RESET Button" in this chapter.

Use the control panel to set the configuration of the printer to meet your needs and then enter this mode menu to save your settings. Two sets of user settings can be saved in the printer as follows:

Display Message	User Setting
SAVE SETTING 1	Save the current settings as No. 1 in the printer's memory.
SAVE SETTING 2	Save the current settings as No. 2 in the printer's memory.

If you want to check the user settings, you can print a list of the settings with the **Test** button. See "TEST Button" in this chapter.

> **Note**
> No user settings have been factory set.

TIME SETTINGS

A Real time clock is built into this printer. You can set the time in this mode.

Display Message	User Setting
TIME SETTING	Set the time.
TIME STYLE	Set the time style shown on the display.
SUMMER TIME	Set summer time.
TIME ZONE	Set time zone.

Please refer to the following chart when you want to set the Time Zone.

- 12.0	Eniwetok, Kwajalein
- 11.0	Midway Island, Samoa
- 10.0	Hawaii
- 9.0	Alaska
- 8.0	Pacific time (US & Canada)
- 7.0	Mountain time (US & Canada), Arizona
- 6.0	Central time (US & Canada), Mexico City, Saskatchewan
- 5.0	Eastern time (US & Canada), Bogota, Lima
- 4.0	Atlantic (Canada), Caracas, La Paz
- 3.5	Newfoundland
- 3.0	Brasilia, Buenos Aires, Georgetown
- 2.0	Mid-Atlantic
- 1.0	Azores, Cope Verde Is.
0.0	Greenwich Mean Time, Dublin, Edinburgh, London, Monrovia, Casablanca
+ 1.0	Berlin, Stockholm, Rome, Bern, Brussels, Vienna, Amsterdam, Paris, Madrid, Prague, Bratislava, Warsaw
+ 2.0	Athens, Helsinki, Istanbul, Cairo, Eastern Europe, Harare, Pretoria, Israel
+ 3.0	Baghdad, Kuwait, Nairobi, Riyadh, Moscow, St. Petersburg
+ 3.5	Tehran
+ 4.0	Abu Dhabi, Muscat, Tbilisi, Kazan, Volgograd
+ 4.5	Kabul
+ 5.0	Islamabad, Karachi, Ekaterinburg, Tashkent
+ 5.5	Bombay, Calcutta, Madras, New Delhi, Colombo
+ 6.0	Almaty, Dhaka
+ 7.0	Bangkok, Jakarta, Hanoi
+ 8.0	Beijing, Chongqing, Urumqi, Hong Kong, Perth, Singapore, Taipei
+ 9.0	Tokyo, Osaka, Sapporo, Seoul, Yakutsk
+ 9.5	Adelaide, Darwin
+ 10.0	Brisbane, Canberra, Melbourne, Sydney, Guam, Port Moresby, Vladivostok, Harare
+ 11.0	Magadan, Solomon Is., New Caledonia
+ 12.0	Fiji, Kamchatka, Marshall Is., Wellington, Auckland

PAGE COUNTER

You can check the total number of printed pages with this mode. When you enter this mode, the display shows the number for a short time and then automatically moves to “exit MODE” menu.

EXIT MODE

When you finish setting your desired option in the mode menus, advance to the following message:

```
MODE
exit MODE
```

Press the **Set** button to exit from the mode menus to the off-line ready state.

> **Note**
> Remember that you can exit from the mode menu at any time with the **Sel** button. After you make a setting effective with the **Set** button, press the **Sel** button. You will exit from the mode menu to the on-line ready state. The settings you have changed with the **Set** button are effective after a quick exit.

FONT Button

Pressing the **Font** button allows you to select fonts and symbol/character sets.

Notes

When you use the **Font** button, note the following:

- The **Font** button is effective in the HP PCL5C, EPSON FX-850, and IBM Proprinter XL modes. However the settings are subject to the current emulation mode. Note that the **Font** button does not work in the BR-Script 2 mode.
- If the application software supports font and symbol/character set selection, you do not need to set them with the **Font** button. The software or command setting overrides the button setting.
- If you want to use optional fonts instead of the printer's resident fonts, be sure to install a font cartridge/card that has your preferred fonts. The printer automatically selects the font that has exactly the same or similar characteristics as those you set through the software or with a command. If the installed font cartridge/card happens to have a font of similar characteristics, the printer will print with an unexpected font.
- You can store the fonts you require on a flash memory card or HDD card only in the HP PCL5C mode or BR-Script 2 mode when a card is installed. See "DEVICE OPERATION."

Setting the Font and Symbol Set in the HP PCL5C Mode

When the HP PCL5C emulation mode has been selected, the font and symbol set can be set separately as the primary or secondary font.

When the primary font is selected;

Message	To do:
SELECT FONT P	Set the primary font
SYMBOL SET P	Set the symbol set
TABLE PRINT P	Print the code table

When the secondary font is selected;

Message	To do:
SELECT FONT S	Set the secondary font
SYMBOL SET S	Set the symbol set
TABLE PRINT S	Print the code table

To select the font and symbol set in the HP PCL5C mode, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Press the **Font** button and then press the ▲ or ▼ button to select the primary or secondary font setting menu.

3. Press the **Set** button.

 The display shows the font setting menu. You can skip the font setting menu and advance to the symbol set setting menu with the ▲ or ▼ button.

> **Note**
> The last lowercase letter “p” or “s” indicates the primary or secondary font setting mode. If you select the secondary font setting mode, the display shows “s” in the following messages.

4. Press the **Set** button.

 When you enter the “SELECT FONT” menu, you can select the internal font, optional slot font or permanent download font.
 Press the ▲ or ▼ button until the desired font source appears on the display.

Display Message	Font Source
INTERNAL FONT	Internal font of the printer
DEVICE1 FONT	Optional card font in slot 1
DEVICE2 FONT	Optional card font in slot 2
DEVICE3 FONT	Optional HDD.
PERMANENT FONT	Permanent download font defined in the HP emulation mode

Since these steps instruct you how to select the standard font, select the “INTERNAL FONT” message.

> **Notes**
> When you select the optional fonts or permanent download fonts, note the following:
> - If the optional font cartridge/card is not installed, the optional font cannot be selected. No selection appears on the display.
> - If permanent fonts are not downloaded in the HP emulation mode or another emulation mode is selected, they cannot be selected. No selection appears on the display.
> - The list you can print with the **Test** button helps you to select the optional fonts or permanent download fonts. See “TEST button” in this chapter or “Selecting the Optional Fonts” in Chapter 5.

5. Press the **Set** button.

 When you enter the font setting mode, the display first shows the current font with an asterisk.

6. Press the ▲ or ▼ button until the desired font appears on the display.
 See "List of Fonts".

7. Press the **Set** button to make the displayed selection effective.

■ If you select a resident bitmapped font (Letter Gothic 16.66) or optional bitmapped fonts, the display shows the symbol set selection menu.
Go to step 8.

■ If you select resident scalable fonts or optional scalable fonts, t he display shows the font style setting menu and then changes to the font size menu.
Press the ▲ or ▼ button until the desired style appears on the display.

Display Message	Font Style
Lt	Light
Reg	**Regular, Roman, Book, or Antique**
Bd	Bold or Demi
Xb	Extrabold
It	Italic or Oblique

Note
The style indication appears after the font name and the style name differs according to the font name. The italic or oblique indication can appear after another style indication: "BdIt" indicates a bold italic font, "LtIt" indicates a light italic font, etc.

8. Press the **Set** button to make the displayed selection effective, then the display shows the font size selection menu.

> **Note**
> When you have selected fixed-pitch fonts, you set the font size by the character pitch (width). When you have selected proportional spacing fonts, you set the font size in points (height). The display shows “PITCH” or “POINT” accordingly.

9. Press the ▲ or ▼ button until the desired font size appears on the display.

10. Press the **Set** button to make the displayed selection effective. The blinking cursor then moves to the decimal part of the number.

11. Press the ▲ or ▼ button until the desired decimal number appears on the display.

12. Press the **Set** button to make the displayed selection effective. The display then shows the symbol set selection menu.

13. Press the **Set** button.
When you enter the symbol set setting mode, the display first shows the current symbol set with an asterisk.

14. Press the ▲ or ▼ button until the desired symbol set appears on the display.
See “List of Symbol/Character Sets”.

15. Press the **Set** button to make the displayed selection effective. The display then shows the next menu.

16. Press the **Set** button to start printing the code table of the selected font, or press the ▲ or ▼ button to skip this menu. The display shows the exit menu.

17. Press the **Set** button to exit from the setting mode.

18. The printer returns to the off-line state.

Setting the Font and Character Set in the EPSON FX-850 or IBM Proprinter XL Mode

When the EPSON FX-850 or IBM Proprinter XL mode has been selected, the font and character set can be selected.

Message	To do:
SELECT FONT	Set the font
CHARACTER SET	Set the character set
TABLE PRINT	Print the code table

To select the font and character set in the EPSON FX-850 or IBM Proprinter XL mode, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Press the **Font** button.
 The display shows the font setting menu. You can skip the font setting menu and advance to the character set setting menu with the ▲ or ▼ button.

3. Press the **Set** button.
 When you enter the "SELECT FONT" menu, you can select the internal font, optional slot font or permanent download font.
 Press the ▲ or ▼ button until the desired font source appears on the display.

Display Message	Font Source
INTERNAL FONT	Internal font of the printer
DEVICE1 FONT	Optional card font in slot 1
DEVICE2 FONT	Optional card font in slot 2
DEVICE3 FONT	Optional HDD.
PERMANENT FONT	Permanent download font defined in the HP emulation mode

Since these steps instruct you how to select the standard font, select the "INTERNAL FONT" message.

Notes
When you select the optional fonts or permanent download fonts, note the following:

- If the optional font card is not installed, the optional font cannot be selected. No selection appears on the display.
- If permanent fonts are not downloaded in the HP emulation mode or another emulation mode is selected, the permanent fonts cannot be selected. No selection appears on the display.
- When you select the optional font or download font, press the **Set** button to enter the sub-menu. After you select your desired font with the ▲ or ▼ button, press the **Set** button again. The list you can print with the **Test** button helps you to select the optional fonts or permanent download fonts. See "TEST button" in this chapter or "Selecting the Optional Fonts" in Chapter 5.

4. Press the **Set** button.
 When you enter the font setting mode, the display first shows the current font with an asterisk.

5. Press the ▲ or ▼ button until the font you want appears on the display.
 See "List of Fonts".

6. Press the **Set** button to make the displayed selection effective.
 The steps you follow will vary according to the font type, scalable or bitmapped.

■ If you select a resident bitmapped font (Letter Gothic 16.66) or optional bitmapped fonts, the display shows the character set selection menu.

Go to step 7.

■ If you select the resident scalable fonts or optional scalable fonts, the display shows the font style selection menu and then changes to the font size menu.

7. Press the ▲ or ▼ button until the desired style appears on the display.

Display Message	Font Style
Lt	Light
Reg	**Regular, Roman, Book, or Antique**
Bd	Bold or Demi
Xb	Extrabold
It	Italic or Oblique

> **Note**
> The style indication appears after the font name and the style name differs according to the font name. The italic or oblique indication can appear after another style indication: "BdIt" indicates a bold italic font, "LtIt" indicates a light italic font, etc.

8. Press the **Set** button to make the displayed selection effective, then the display shows the font size selection menu.

> **Note**
> When you have selected fixed-pitch fonts, you set the font size by the character pitch (width). When you have selected proportional spacing fonts, you set the font size in points (height). The display shows "PITCH" or "POINT" accordingly.

9. Press the ▲ or ▼ button until the font size you want appears on the display.

10. Press the **Set** button to make the displayed selection effective. Then the blinking cursor moves to the decimal part of the number.

11. Press the ▲ or ▼ button until the decimal number you want appears on the display.

12. Press the **Set** button to make the displayed selection effective. The display then shows the character set selection menu.

13. Press the **Set** button.

14. When you enter the character set setting mode, the display first shows the current character set with an asterisk.

> **Note**
> The character set varies according to the current emulation mode.

15. Press the ▲ or ▼ button until the character set you want appears on the display.
See "List of Symbol/Character Sets".

16. Press the **Set** button to make the displayed selection effective. Then the display shows the next menu.

17. Press the **Set** button to start printing the code table of the selected font, or press the ▲ or ▼ button to skip this menu. Then the display shows the exit menu.

18. Press the **Set** button to exit from the setting mode. The printer returns to the off-line state.

List of Fonts

Display Message	Font
BROUGHAM	**Scalable Brougham**
LETTERGOTHIC	Scalable LetterGothic
OCR-A	Bitmapped OCR-A 12 cpi
OCR-B	Bitmapped OCR-B 12 cpi
LETTERGOTH16.6	Bitmapped Letter Gothic 16.66 cpi
LTRGOTH16 LTN2	Bitmapped Letter Gothic 16.66 cpi ISO 8859-1 Latin2
LTRGOTH16 LTN5	Bitmapped Letter Gothic 16.66 cpi ISO 8859-1 Latin5
LTRGOTH16 LTN6	Bitmapped Letter Gothic 16.66 cpi ISO 8859-1 Latin6
PcTENNESSEE	Scalable PC Tennessee
OKLAHOMA	Scalable Oklahoma
CONNECTICUT	Scalable Connecticut
CLEVELAND Cd	Scalable Cleveland Condensed
PcBRUSSELS	Scalable PC Brussels
UTAH	Scalable Utah
UTAH CONDENSED	Scalable Utah Condensed
AntiqueOAKLAND	Scalable Antique Oakland
GUATEMALA	Scalable Guatemala Antique
MARYLAND	Scalable Maryland
ALASKA	Scalable Alaska
HELSINKI	Scalable Helsinki
BR SYMBOL	Scalable BR Symbol
TENNESSEE	Scalable Tennessee
W DINGBATS	Scalable W Dingbats
GERMANY	Scalable Germany
SAN DIEGO	Scalable San Diego
BERMUDA SCRIPT	Scalable Bermuda Script
US ROMAN	Scalable US Roman
ATLANTA	Scalable Atlanta
COPENHAGEN	Scalable Copenhagen
PORTUGAL	Scalable Portugal
CALGARY	Scalable Calgary

List of Symbol/Character Sets

The symbol sets and character sets are subject to the current emulation mode.

HP PCL5C	EPSON	IBM
ROMAN 8	US ASCII *	PC-8 *
ISO LATIN1	GERMAN	PC-8 D/N
ISO LATIN2	UK ASCII I	PC-850
ISO LATIN5	FRENCH I	PC-852
ISO LATIN6	DANISH I	PC-860
PC-775	ITALY	PC-863
PC-8 *	SPANISH	PC-865
PC-8 D/N	SWEDISH	PC-8 TURKISH
PC-850	JAPANESE	
PC-852	NORWEGIAN	
PC-8 TURKISH	DANISH II	
PC-1004	UK ASCII II	
WINDOWS LATIN1	FRENCH II	
WINDOWS LATIN2	DUTCH	
WINDOWS LATIN5	SOUTH AFRICAN	
WINDOWS BALTIC	PC-8	
DESKTOP	PC-8 D/N	
PS TEXT	PC-850	
VENTURA INTL	PC-852	
VENTURA US	PC-860	
MS PUBLISHING	PC-863	
MATH-8	PC-865	
PS MATH	PC-8 TURKISH	
VENTURA MATH		
PI FONT		
LEGAL		
ISO 2 IRV		
ISO 4 UK		
ISO 6 ASCII		
ISO10 SWE/FIN		
ISO11 SWEDISH		
ISO14 JISASCII		
ISO15 ITALIAN		
ISO16 POR		
ISO17 SPANISH		
ISO21 GERMAN		
ISO25 FRENCH		
ISO57 CHINESE		
ISO60 NOR v1		
ISO61 NOR v2		
ISO69 FRENCH		
ISO84 POR		
ISO85 SPANISH		
WINDOWS 3.0		
HP GERMAN		
HP SPANISH		
MC TEXT		

Note
The factory settings are indicated by an asterisk " * " in the table above.

FORM FEED Button (REPRINT Button)

The **Form Feed** button works in two ways according to the **Data** LED status.

Form Feed

When the printer is off-line and there is data remaining in the printer memory, the **Data** LED comes on. Pressing the **Form Feed** button executes a form feed and prints the remaining data.

If you set the number of copies with the **Copy** button and press the **Sel** button during copy printing, the printer suspends the form feed operation.

Pressing the **Sel** button again resumes the form feed operation.

If no data remains in the printer memory and you press the **Form Feed** button, the printer ignores this button operation.

> **Note**
> If you want the printer to print the remaining data automatically, you can set the auto form feed function with the **Mode** button. See "AUTO FORMFEED" in this chapter.

Reprint Function

You can reprint the last print job without sending it from the computer again. When you press the **Form Feed** button with the **Data** LED off, the printer reprints the pages of the last print job. You can use this function to recover printing when a paper jam has occurred.

After printing is finished, set the printer off-line and press the **Form Feed** button once, so that the printer prints the pages of the last print job. However, if there is not enough memory to keep all the pages of the last print job, the printer will print only the last page of the last job.

When you press the **Form Feed** button one or more times during reprinting, you can set the number of copies to reprint. The printer reprints the last job the number of times you press the button.

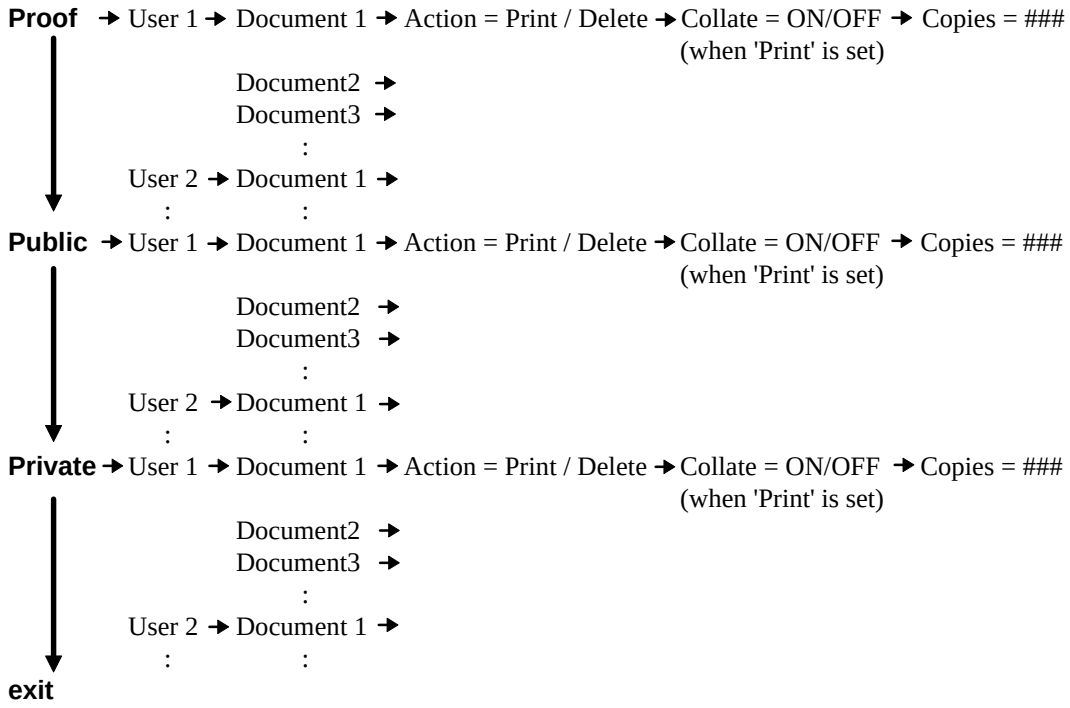
> **Note**
> The reprint data remains in the printer's memory until the printer is reset or the emulation, or some settings, are changed. After you have reprinted confidential data, be sure to reset the printer to clear it from the printer memory.

You can set 4 attributes (Proof, Public, Private and Print only) for each documentation through the printer driver. Documents which have the Proof, Public or Private attributes set will be stored in the HDD and you can re-print these documents whenever you like.
When you want to print a document which is stored in the HDD, you can do collated printing of multiple copies of the document.

When the printer is idle and the optional HDD is installed, when you press the **FormFeed** button, the printer displays the following messages.

Display Message	Function
PROOF	• The data sent will be printed and stored in the HDD. • Anybody can re-print the data from the control panel or the browser. • When the HDD becomes full, or the number of documents stored exceeds the document save limit number, the excess documents will be deleted starting from the oldest ones. • Anybody can delete the data from the control panel or the browser.
PUBLIC	• The data sent will be stored in the HDD. (not printed) • Anybody can re-print the data from the control panel or the browser. • Anybody can delete the data manually from the control panel or the browser.
PRIVATE	• The data and password sent will be stored in the HDD. (not printed) • You can print the data by inputting the password you set from the control panel or the browser. • You need to input the password you set when you want to delete the data you stored in the HDD from the control panel or the browser.

This function works as follows.



CONTINUE Button

If there is a problem with the printer, it automatically suspends printing and goes off-line. Pressing the **Continue** button may ignore the error and resume printer operation.

The function of this button varies according to the CONTINUE mode set with the **Mode** button.

Since the CONTINUE mode has been factory set to MANUAL, you need to press the **Continue** button to recover from a printer error message. If you set the mode to AUTO, the printer attempts to resume the printing operation without the need to press the **Continue** button.

For more information, see "CONTINUE MODE" in this chapter.

> **Note**
> The **Continue** button is not a cure-all. The printer cannot recover from some errors. Take corrective action, referring to the error message. See "TROUBLESHOOTING" in Chapter 6.

BUTTONS IN SHIFT MODE

You can control the basic printer operations and make various printer settings also in SHIFT mode. Functions available in SHIFT mode are labeled with the indications just below the panel buttons.

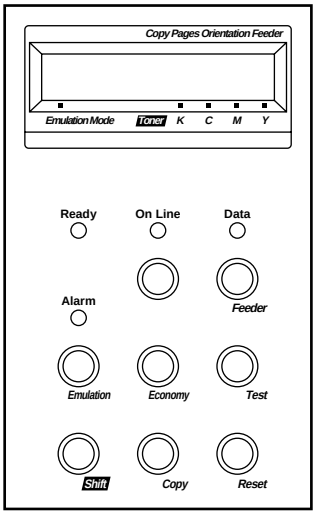


Fig. 4-8 Buttons in SHIFT Mode

> **Note**
> The factory settings are printed in bold in this section.

SHIFT Button

When you hold the **Shift** button down with the printer off-line, you can change settings with the panel buttons in SHIFT mode. Since the shift state is not locked, you need to hold it down and press the button to get access to the corresponding shifted function labeled under the button.

EMULATION Button

This factory setting for the automatic emulation selection function is ON. The printer will select the emulation mode automatically when it receives data from the computer.

To set the emulation mode manually, hold down the **Shift** button and press the **Emulation** button. Then enter the setting mode to change the emulation.

To set the emulation mode, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Hold down the **Shift** button and press the **Emulation** button. When you enter the setting mode, the display first shows the current emulation mode with an asterisk.

3. Press the ▲ or ▼ button until the emulation mode you want appears on the display.

Display Message	Emulation Mode
AUTO	**Auto Emulation Selection**
HP PCL5C	HP PCL5C
BR-Script 2	BR-Script level 2 mode
HP-GL	HP-GL Plotter Mode
EPSON FX-850	EPSON FX-850
IBM ProprinterXL	IBM Proprinter XL

4. Press the **Set** button to make the displayed selection effective. When you select any specific emulation mode other than "AUTO," for a short time an asterisk appears at the end of the display. Then the printer automatically exits from the setting mode to the off-line mode.
When you select "AUTO," the sub-item "Time Out" for the automatic emulation selection appears on the display. Go to the next step.

5. Set "Time Out" with the ▲ or ▼ button.
This time out is the duration during which the printer will not allow another automatic emulation change. You can set it from 1 second to 99 seconds: **the factory setting is 5 seconds.**

6. Press the **Set** button.
The next sub-item "EPSON/IBM" appears on the display.

7. Select EPSON or IBM with the ▲ or ▼ button.
 Since the printer cannot distinguish between the EPSON and IBM emulation modes, you must select the EPSON or IBM emulation even in AUTO mode.
 When the printer receives data from the computer, it automatically selects the emulation mode in any of the following combinations:

EPSON/IBM Priority	**EPSON**	IBM
Auto Selection Mode	HP PCL5C	HP PCL5C
	BR-Script 2	BR-Script 2
	HP-GL	HP-GL
	EPSON FX-850	IBM Proprinter XL

8. Press the **Set** button.
 The next sub-item "KEEP PCL" appears on the display.
 This function is for permanent macros and fonts downloaded in the HP PCL5C mode.

9. Turn on or off the "KEEP PCL" function with the ▲ or ▼ button.
 When you do not need to keep the permanent macros and fonts used in HP PCL5C mode, turn this function off. When you want to keep them, you can turn it on.
 If the function is turned on, the downloaded macros and fonts are kept in the printer's memory until the printer is turned off, so that they are not cleared by changing the emulation to BR-Script 2 mode.

> **Note**
> The "KEEP PCL" function reserves free space in the printer's memory and may cause a memory full error. If a memory full error occurs, expand the memory capacity or turn off this function.

10. Press the **Set** button.
 The "exit" message appears on the display.

11. Press the **Set** button again.
 The printer exits from the setting mode to the off-line state.

> **Note**
> When you use the automatic emulation selection, try it with your application software or network server. If the function does not work properly, select a particular emulation mode manually. You can use the following commands to select the emulation on a network.
>
> | Commands | Hex | Emulation |
> |---|---|---|
> | ESC CR H | 1B 0D 48 | HP PCL5C |
> | ESC CR AB | 1B 0D 41 42 | BR-Script 2 |
> | ESC CR GL | 1B 0D 47 4C | HP-GL |
> | ESC CR E | 1B 0D 45 | EPSON FX-850 |
> | ESC CR I | 1B 0D 49 | IBM Proprinter XL |

About Emulation Modes

This printer has the following emulation modes:

■ HP PCL5C Mode

This printer emulates Hewlett-Packard PCL5C color printers and PCL6 monochrome printers. This is the default emulation setting of the printer. Since many popular software packages support this emulation, this may be the best choice for general use.

■ BR-Script 2 Mode (color)

BR-Script is a Brother original page description language and it is a PostScript® language emulation interpreter. This printer has level 2 BR-Script, which supports full color printing at 600 dpi. BR-Script enables superior control for text and graphics printing. The HL2400Ce will deliver optimum performance in this mode.

Average users do not need to know much about PostScript® language. If you want to obtain technical information about PostScript® , please refer to the following commercial manuals:

- Adobe Systems Incorporated. *PostScript® Language Reference Manual, 2nd Edition.* Menlo Park: Addison-Wesley Publishing Company, Inc., 1990.
- Adobe Systems Incorporated. *PostScript® Language Program Design.*
 Menlo Park: Addison-Wesley Publishing Company, Inc., 1988.
- Adobe Systems Incorporated. *PostScript® Language Reference Manual.* Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.
- Adobe Systems Incorporated. *PostScript® Language Tutorial and Cookbook.* Menlo Park: Addison-Wesley Publishing Company, Inc., 1985.

■ HP-GL Mode (monochrome)

The HP-GL mode is the emulation mode where this printer emulates the Hewlett-Packard plotter model HP-7475A. Since many graphics and CAD applications support this type of plotter, you can get more out of this printer working with your application software.

■ EPSON FX-850 and IBM Proprinter XL Mode (monochrome)

The EPSON FX-850 and IBM Proprinter XL emulations allow the HL-2400Ce to support the printer control language of industry-standard dot matrix printers..

ECONOMY Button

TONER SAVE MODE

You can turn on or off the toner save mode as follows:

Display Message	Toner Save Mode
TONER SAVE=OFF	Turn off the toner save mode. **(Factory setting)**
TONER SAVE=ON	Turn on the toner save mode. The amount of toner on the paper decreases and the printed image may look lighter.

POWER SAVE MODE

You can turn on or off the power save mode as follows:

Display Message	Power Save Mode
POWER SAVE=ON	Turn on the power save mode. The fixing assembly of the print engine is turned off after the specified time to save power. **(Factory setting)**
POWER SAVE=OFF	Turn off the power save mode. The fixing assembly of the print engine is always powered on to keep its temperature at the specified level.

When you turn on the power save mode with the **Set** button, the display shows the next sub-setting menu.

You must set the time out for the power save mode from 1 to 99 minutes with the ▲ or ▼ button: **factory setting =30 minutes**. The time out is the duration after which the fixing assembly of the print engine is turned off ("SLEEP") to save power.

When the power save mode is on, the printer automatically turns on the fixing assembly again after it receives data from the computer. Since the fixing assembly must reach the specified high temperature, it takes a slightly longer time to start printing the first page.

FEEDER Button

You can select the feeder and manual feed mode with the **Feeder** button.

Display Message	Feeder
FEEDER=AUTO	Select a feeder or **auto paper feed**.
MANUAL MODE=ON	Enable/disable the manual feed mode.
MEDIA TYPE	Select print media
SMALL SIZE	Set the small paper size detection for paper sizes under B5(JIS)

You can check the current feeder.
When you want to change settings with the **Feeder** button, hold down the **Shift** button and press the **Feeder** button. You will then enter the setting mode where you change the feeder, manual feed mode, etc.

FEEDER

To select the feeder, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Hold down the **Shift** button and press the **Feeder** button. When you enter the setting mode, the display first shows the current feeder setting with the asterisk.

3. Press the ▲ or ▼ button until the feeder you want appears on the display.

Display Message	Paper Feed Method/Paper Source
FEEDER=AUTO	**Auto paper feed**
FEEDER=TRAY1	Upper Media Cassette (Tray 1)
FEEDER=TRAY2	Optional Lower Media Cassette (Tray 2)

Notes

When you select a feeder, note the following:

- The "FEEDER=TRAY2" message appears only when the optional lower tray unit has been installed.
- The FEEDER=AUTO setting allows you to optimize your printing environment. This setting allows a print job to continue uninterrupted when a paper out condition occurs. The default setting is AUTO. This setting allows a common printing situation: Loading the same size and type of paper in both paper trays allows your print job to continue without error if one of the paper trays becomes empty. The printer automatically will select the other tray when one tray becomes empty.
- When you select FEEDER=AUTO, the printer automatically searches for the paper size you set with the **Mode** button in the PAGE FORMAT mode and then loads the paper from the paper source that contains the selected size of paper. If the upper and lower Media Cassettes contain different sizes of paper and one Media Cassette runs out of paper, the printer stops printing without automatically changing to the other paper source to feed paper. It prevents the incorrect size of paper from being printed by mistake.
- If you have the same size of paper loaded but of different type (i.e.: FORM "A" in Tray 1, Form "B" in Tray 2) we recommended that you change the feeder setting from AUTO to Tray 1. This will pause the printer when a paper empty condition occurs, allowing you to load the correct type of paper. Press **Select** to finish the print job.

4. Press the **Set** button to make the displayed selection effective. When you select "TRAY 1" or "TRAY 2," for a short time an asterisk appears at the end of the display. Then the "exit" message appears on the display. Press the **Set** button again, so the printer exits from the setting mode to the off-line state. When you select "AUTO", the tray selection menu for the auto paper feed appears on the display.

5. Change the tray combination and priority with the ▲ or ▼ button.
 When "AUTO=T1>T2" is set, both Tray 1 and the Tray 2 are selected but tray 1 will be selected first if the paper size in tray 1 and the page size for the print job match each other. (If you are using the optional Lower Tray and want to give priority to Tray 2, you can use the "AUTO=T2>T1" setting.)

6. Press the **Set** button.

MANUAL MODE

This printer has no manual feed tray or multi-purpose tray. Therefore you cannot feed special paper in the usual way. However this printer has a special Manual Feed Mode with Tray 1 to accommodate non-standard paper sizes. When "MANUAL MODE=ON" is selected or a manual feed command is sent to the printer, the printer will wait for you to replace the paper in Tray 1 with the paper for manual printing.

1. Press the ▲ or ▼ button to select the manual mode on or off.

2. Press the **Set** button to make the setting effective.

MEDIA TYPE

When you use anything other than ordinary plain paper (such as thick bond paper, envelope, or transparency), the appropriate media type must be selected in the media type mode to get the best print quality.

1. Press the **Set** button to enter the media type mode. The display then shows the current setting with an asterisk.

2. Press the ▲ or ▼ button to select regular, thick paper or transparency then press the **Set** button to make the setting effective.

> **Note**
> Please do not forget to change the setting back to regular after you have printed on your special media with the setting changed.

SMALL SIZE

This printer can detect the size of paper in the trays automatically. If there is no paper loaded as specified by the user application, the printer prompts the user to load the correct size paper by displaying "LOAD PAPER XX SIZE" on the LCD panel. The printer can detect A4, Letter, Executive, Legal (only in Optional Legal Cassette) and B5(ISO), but not A5, B5(JIS), COM10 and DL size even though they can be handled. For this reason, it is necessary to change the detection size for paper smaller than B5.

1. Press the **Set** button to enter the small size mode. The display then shows the current setting with an asterisk. Then select "T1" or "T2".

2. Press the ▲ or ▼ button to select B5 (JIS), B5 (ISO), A5, COM10 or DL then press the **Set** button to make the setting effective.
 (B5 (JIS) and B5 (ISO) only for "T2".)

COPY Button

You can set the number of copies to print of the same page with the **Copy** button. The job will print faster than choosing the copy print quantity from within your application software. Check the current setting on the display.

When the number of copies has been set to 3, the display may look as follows:

```
LJ READY 003P T1
AUTO
```

> **Note**
> If you send too many pages to be stored in the printer memory, part or all of the set of pages or copies may not be printed.

To set the number of copies, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Hold down the **Shift** button and press the **Copy** button. When you enter the setting mode, the display first shows the current setting with the asterisk.

3. Press the ▲ or ▼ button until the desired number appears on the display.

Display Message	# of Copies to Print Same Pages
COPY PAGES= 1	**1 page**
COPY PAGES= 2	2 pages
...	. . .
COPY PAGES=999	999 pages (max.)

4. Press the **Set** button to make the displayed selection effective. For a short time an asterisk appears at the end of the display. The printer then automatically exits from the setting mode to the off-line state.

RESET Button

You can reset the printer with the **Reset** button. The print data that the printer has already received from the computer is cleared and the printer settings are restored to the user settings or factory settings.

Any temporary download fonts and macro settings selected with commands in HP PCL5C mode are also cleared.

To reset the printer, follow these steps:

1. Press the **Sel** button to take the printer off-line.
2. Hold down the **Shift** button and press the **Reset** button. When you enter the reset mode, the display shows the first reset mode item.
3. Press the ▲ or ▼ button until the reset mode you want appears on the display.

Display Message	Reset Mode
RESET PRINTER	Resets the printer and restores all printer settings–including command settings–to settings you have previously made.
RESET SETTING 1 RESET SETTING 2	Resets the printer and restores all printer settings–including command settings–to the selected number (1-2) of user settings you have previously made with the **Mode** button.
FACTORY SETTINGS	Resets the printer and restores all printer settings–including command settings–to the factory settings. See “List of Factory Settings.”
RESET PARTS LIFE	This menu appears only when a maintenance part is recommended for replacement. Resets the life counter of the maintenance part that has been replaced. See Chapter 5 for detailed information.
Exit	Exits from the reset mode. The printer is not reset.

4. Press the **Set** button to make the displayed selection effective. The printer is reset according to the selected reset mode.

Selected Mode	LCD message
RESET PRINTER	08 RESET TO ↔USER SETTINGS
RESET SETTING 1-2	08 RESET TO ↔SETTING # 1*
FACTORY SETTINGS	09 RESET TO ↔FACTORY SETTINGS

1* - # indicates the selected number of saved settings

The printer automatically exits from the reset mode to the on-line state.

5. When you enter the RESET PARTS LIFE mode:

LCD Message	Parts replaced
FC ROLLER	Fuser Cleaner
OPC BELT	(OPC) Belt Cartridge
FUSER UNIT	Fixing Unit
120K KIT	Drum Cleaner, Paper Discharge, Transfer Roller

The reset item is selected according to the Maintenance message that shows the currently recommended part to replace. Press **Set** to reset the parts life. See Chapter 5 for more detailed information.

List of Factory Settings

The following table shows the factory settings made before shipment.

Notes
- The settings are subject to the emulation mode. Effective modes are indicated in parentheses in the following table.
- The following settings cannot be restored to the factory settings with the **Reset** button in the "FACTORY SETTINGS" mode: INTERFACE MODE, HRC SETTING, PAGE PROTECTION, SCALABLE FONT, LOCK PANEL, PAGE COUNTER and local LANGUAGE for display messages.
- The COPY setting is always restored to the factory setting when the printer is turned off and on again.
- The user settings are overwritten after resetting to User Settings 1 or 2.

Button	Item	Sub-Item	Factory Setting
MODE			
	INTERFACE MODE	–	I/F=AUTO
		For AUTO mode	
		TIME OUT	TIME OUT= 5s
		For bi-directional PARALLEL interface	
		HIGH SPEED	HIGH SPEED=ON
		BI-DIR	BI-DIR=ON
		For RS-232C serial interface	
		Baud Rate	BaudRate= 9600
		Code Type	CodeType=8 bits
		Parity	Parity =NONE
		Stop Bit	Stop Bit= 1 bits
		Xon/Xoff	Xon/Xoff=ON
		DTR (ER)	DTR (ER)=ON
		Robust Xon	Robust Xon=OFF
	FORMAT MODE	ORIENTATION (Except for BR-Script 2)	ORI=PORTRAIT
		AUTO MODE (HP PCL5C)	
		AUTO LF	OFF
		AUTO CR	OFF
		AUTO WRAP	OFF
		AUTO SKIP	ON
		AUTO MODE (EPSON)	
		AUTO LF	OFF
		AUTO CR	ON (No indication)
		AUTO WRAP	ON (No indication)
		AUTO MASK	OFF
		AUTO MODE (IBM)	
		AUTO LF	OFF
		AUTO CR	OFF
		AUTO WRAP	ON (No indication)
		AUTO MASK	OFF

Button	Item	Sub-Item	Factory Setting
MODE (continued)			
	FORMAT MODE (continued)		
		PAGE FORMAT MODE (HP PCL5C, EPSON, & IBM)	
		PAPER	LETTER (For 110/120V model) A4 (For 220/240V model)
		LEFT M	0 (LETTER, Portrait) 0 (LEGAL, Portrait) 0 (A4, Portrait) 0 (A5, Portrait) 0 (B5, Portrait) 0 (JIS B5, Portrait) 0 (EXE, Portrait) 0 (COM10, Portrait) 0 (DL, Portrait) 0 (LETTER, Landscape) 0 (LEGAL, Landscape) 0 (A4, Landscape) 0 (A5, Landscape) 0 (B5, Landscape) 0 (JIS B5, Landscape) 0 (EXE, Landscape) 0 (COM10, Landscape) 0 (DL, Landscape)
		RIGHT M	80 (LETTER, Portrait) 80 (LEGAL, Portrait) 78 (A4, Portrait) 53 (A5, Portrait) 64 (B5, Portrait) 67 (JIS B5, Portrait) 67 (EXE, Portrait) 36 (COM10, Portrait) 38 (DL, Portrait) 106 (LETTER, Landscape) 136 (LEGAL, Landscape) 113 (A4, Landscape) 113 (A5, Landscape) 113 (A6, Landscape) 94 (B5, Landscape) 97 (JIS B5, Landscape) 101 (EXE, Landscape) 91 (COM10, Landscape) 82 (DL, Landscape)
		TOP M	0.5" (HP) 0.33" (Non-HP)
		BOTTOM M	0.5" (HP) 0.33" (Non-HP)

Button	Item	Sub-Item	Factory Setting
MODE (continued)	PAGE FORMAT (continued)	LINES (HP)	60 (LETTER, PORTRAIT)
			78 (LEGAL, PORTRAIT)
			64 (A4, PORTRAIT)
			64 (A5, PORTRAIT)
			53 (B5, Portrait)
			54 (JIS B5, Portrait)
			57 (EXE, Portrait)
			51 (COM10, Portrait)
			45 (DL, Portrait)
			45 (LETTER, LANDSCAPE)
			45 (LEGAL, LANDSCAPE)
			43 (A4, LANDSCAPE)
			43 (A5, LANDSCAPE)
			35 (B5, Landscape)
			36 (JIS B5, Landscape)
			37 (EXE, Landscape)
			18 (COM10, Landscape)
			19 (DL, Landscape)
		LINES (Non-HP)	62 (LETTER, PORTRAIT)
			80 (LEGAL, PORTRAIT)
			66 (A4, PORTRAIT)
			66 (A6, PORTRAIT)
			55 (B5, Portrait)
			56 (JIS B5, Portrait)
			59 (EXE, Portrait)
			53 (COM10, Portrait)
			47 (DL, Portrait)
			47 (LETTER, LANDSCAPE)
			47 (LEGAL, LANDSCAPE)
			45 (A4, LANDSCAPE)
			45 (A5, LANDSCAPE)
			37 (B5, Landscape)
			38 (JIS B5, Landscape)
			39 (EXE, Landscape)
			20 (COM10, Landscape)
			21 (DL, Landscape)
		X OFFSET	X OFFSET=0
		Y OFFSET	Y OFFSET=0
	COLOR MODE	COLOR PRINT	COLOR PRINT=ON
	FORMAT MODE (BR-Script 2)		
		X OFFSET	X OFFSET=0
		Y OFFSET	Y OFFSET=0
	FORMAT MODE (HP-GL)	PAGE FORMAT MODE	
		PAPER	LETTER (For 110/120V model)
			A4 (For 220/240V model)
		X OFFSET	X OFFSET=0
		Y OFFSET	Y OFFSET=0
		GRAPHICS MODE (HP-GL)	
		PEN SETTING	SIZE: 3 dots
			GRAY: 100%

Button	Item	Sub-Item	Factory Setting
MODE (continued)			
	RESOLUTION MODE	RESOLUTION	RESOLUTION=600
		CAPT SETTING	CAPT=OFF
		HRC SETTING	HRC=MEDIUM
	PAGE PROTECTION (Non-BR-Script2)	–	PROTECT=AUTO
	ADVANCED MODE		
		LOCK PANEL	LOCK PANEL=OFF
		AUTO FF	AUTO FF=OFF
		For AUTO FF=ON WAIT TIME	WAIT TIME= 5s
		FF SUPPRESS	FF SUPPRESS=OFF
		ERROR PRINT (BR-Script2)	ERROR PRINT=OFF
		CONTINUE MODE	CONTINUE=MANUAL
		SCALABLE FONT (HP, EPSON, & IBM)	FONT=ALL
		For any interfaces INPUT BUFFER	❑❑❑❑❑
	PAGE COUNTER	–	0
FONT (HP)			
	PRIMARY FONT	SELECT FONT	BROUGHAM
		SYMBOL SET	PC-8
	SECONDARY FONT	SELECT FONT	BROUGHAM
		SYMBOL SET	PC-8
FONT (EPSON)			
	FONT	–	BROUGHAM
	CHARACTER SET	–	US ASCII
FONT (IBM)			
	FONT	–	BROUGHAM
	CHARACTER SET	–	PC-8
EMULATION			
	–	–	AUTO
	For AUTO mode	TIME OUT	TIME OUT= 5s
		EPSON/IBM	EPSON/IBM=EPSON
		KEEP PCL	KEEP PCL=OFF

Button	Item	Sub-Item	Factory Setting
ECONOMY		–	
	TONER SAVE MODE	-	TONER SAVE=OFF
	POWER SAVE MODE	-	POWER SAVE=ON
		For POWER SAVE=ON	
		TIME OUT	TIME OUT=30m
FEEDER			
	FEEDER	-	FEEDER=AUTO
			For FEEDER=AUTO
			AUTO=T1>T2
	MANUAL MODE	-	MANUAL MODE=OFF
	MEDIA TYPE	-	REGULAR
	SMALL SIZE	-	SIZE=ISO B5
COPY	–	–	COPY PAGES=1
LANGUAGE (FORM FEED + POWER ON)		–	LANG=ENGLISH

TEST Button

You can test the printer or print the list of fonts with the **Test** button. To do so, hold down the **Shift** button and press the **Test** button. You will then enter the test mode where you can test the printer or print the list of fonts.

To test the printer, follow these steps:

1. Press the **Sel** button to take the printer off-line.

2. Hold down the **Shift** button and press the **Test** button. When you enter test mode, the display shows the first test mode item.

3. Press the ▲ or ▼ button until the test mode you want appears on the display.

Display Message	Test Mode
DEMO PAGE	Prints the demonstration page.
TEST PRINT	Performs the printer test and prints the test pattern.
PRINT CONFIG	Prints the list of control panel settings you have configured for the printer as user settings.
PRINT FONTS I	Prints the list of internal or resident fonts.
PRINT FONTS C	Prints the list of optional fonts stored in the font card.
PRINT FONTS P	Prints the list of permanent download fonts.
exit	Exits from the test mode. The printer does not perform the test.

Note
The message “PRINT FONTS C” or “PRINT FONTS P” appears only when the optional font card is installed in the font slot or permanent download fonts are stored in printer memory.

- If the optional font card is installed, you can print the list of optional fonts. Since the list shows the ID numbers specific to each optional font, it helps you to select them with the **Font** button.
- If user-defined characters are already downloaded into the printer memory as permanent download fonts, you can print the list of them. For more information, see “FONT Button” in this chapter. Press the **Set** button to make the displayed selection effective

The printer prints the test patterns or lists according to the selected test mode.

Note
The printed list shows the panel button settings you have made as user settings with the **Mode** button. See “SAVE SETTINGS” in this chapter.

When the printer finishes printing, it automatically exits from the test mode to the off-line state.

HEX DUMP MODE

This printer has a useful Hex Dump Mode for checking the print data sent from your computer. The printer lists the print data in hexadecimal form.

To enter the hex dump mode, follow these steps:

1. Check the power state.

2. Operate the buttons according to the power state.

- If the printer has been turned off, turn on the printer.

 The printer starts the self-test and the display shows the following message.

  ```
  04 SELF TEST
  ```

- If the printer has been turned on, reset the printer with the **Reset** button.
 1) Press the **Sel** button to take the printer off-line.
 2) Hold down the **Shift** button and press the **Reset** button.
 The display will show "RESET PRINTER".
 3) Press the **Set** button with the "RESET PRINTER" selected.

3. Hold down the **Continue** / **Shift** button.

 The printer checks the **Continue** / **Shift** button at the end of self-test or printer reset. If the button is held down, the printer enters the hex dump mode and goes on-line. The display will show the message "HEX DUMP MODE" and the printer will return to the on-line state.

> **Note**
> If the printer returns to the on-line state without displaying the message "HEX DUMP MODE", you did not hold down the **Continue** / **Shift** button *immediately* after pressing the **Set** button. Try the above steps once again.

4. Send data from your computer.
 When the printer receives data, it starts printing hexadecimal values of the received data.

To exit from the hex dump mode, follow these *basic* steps:

1. Press the **Sel** button to take the printer off-line.
2. Reset the printer with the **Reset** button.

 Or turn off the printer, wait for a few seconds, and turn it on again.

CHAPTER 5 MAINTENANCE

REPLACING THE CONSUMABLES

You will need to replace the following consumables periodically. When the time comes to replace consumables, the following messages will appear on the LCD panel.

The printer will stop printing when the following Operator Call Messages are displayed:

LCD Operator Call Message	Consumable to Replace	Approximate Life	How to Replace	Order No.
16 TONER EMPTY K COLOR	Toner Cartridge Black	10,000 pages *1	See 5-3	TN-01BK
16 TONER EMPTY CMY COLOR	Toner Cartridge Cyan, Magenta or Yellow	6,000 pages *1	See 5-3	TN-01C TN-01M TN-01Y
22 WASTE TONER	Waste Toner Pack	12,000 images *1 *4	See 5-11	WT-1CL
23 OIL EMPTY	Oil Bottle	12,000 pages *1	See 5-6	FO-1CL
24 CHANGE FCR	Fuser Cleaner	12,000 pages *1	See 5-9	FO-1CL CR-1CL

The following are Maintenance Messages that appear on the lower row of the LCD in On Line mode. These messages provide advance warning for replacing each of the consumables before they run out. To avoid any inconvenience, you may want to purchase spare consumables **before** the printer stops printing.

LCD Maintenance Message	Consumable to Replace	Approximate Life	How to Replace	Order No.
(Toner nearly empty) □ ■ ■ ■ K C M Y	Toner Cartridge Black	10,000 pages *1 *2	See 5-3	TN-01BK
(Toner nearly empty) ■ □ □ □ K C M Y	Toner Cartridge Cyan, Magenta or Yellow	6,000 pages *1 *2	See 5-3	TN-01C TN-01M TN-01Y
FUSER OIL LOW	Oil Bottle	12,000 pages *1	See 5-6	FO-1CL

The following are Maintenance Messages and appear on the lower row of the LCD in On Line mode. These messages advise you that you will need to replace each of the consumables as soon as possible, since the consumable end of life has been reached. The printer will continue printing when any of these messages are displayed:

LCD Maintenance Message	Consumable to Replace	Approximate Life	How to Replace	Order No.
REPLACE FCR	Fuser Cleaner	12,000 pages *1	See 5-9	FO-1CL CR-1CL
REPLACE OPC BELT	(OPC) Belt Cartridge	50,000 images (continuously printed) *1*4	See 5-13	OP-1CL
REPLACE FUSER	Fusing unit	40,000 pages *1	See 5-17	
REPLACE 120K KIT	Drum Cleaner, Paper Discharger, Transfer Roller Paper Feeding Roller Separator Pad Transfer Drum	120,000 pages	See 5-20 *3	

Note
The Ozone Filter does not have an LCD message indicator. However, you will need to replace it once a year.

*1 - at 5 % coverage print (A4-Letter size).

Note
The toner cartridges shipped with the printer contain only half the normal amount of toner. (5,000 pages (Black) and 3,000 pages (Cyan, Magenta and Yellow)).

*2 - For example, if the Cyan and Magenta toner cartridges are almost empty, the indication will be "■□□■ " (□ = blinking ■)
K C M Y
If the Cyan and Magenta toner cartridges are empty, the ■ indicator will have disappeared.

*3 - To replace the Paper Feeding Roller, the Separator Pad and the Transfer Drum, consult your local dealer/retailer or Service provider.

*4 - Definition of pages: actual output page number.
Definition of images: if the image on a page contains only one color of either Cyan, Magenta, Yellow or Black =>1 image, two colors => 2 images, three colors => 3 images, four colors => 4 images.

Note
- Discard the used consumables according to local regulations. If you are not sure of them, consult your local dealer/retailer. Be sure to re-seal the consumables tightly so that the material inside does not spill out. Do not discard used consumables together with domestic waste.
- We recommend placing used consumables on a piece of paper or cloth to prevent an accidental spill or scatter of the material inside.

Note

- If you use paper that is not a direct equivalent for the specified paper, consumable and part life may be reduced.
- The Projected Life for each of the items listed are based on an average of 5% coverage of the printable area using any color toner cartridge. Frequency of replacement will vary depending on the complexity of printed pages, percent coverage and media type used.

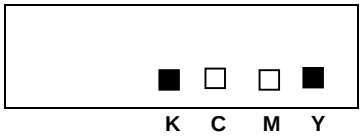
Toner Cartridges

Caution

We strongly recommend using genuine Brother toner cartridges. Using generic or refilled toner cartridges may void the warranty for this printer.

Toner Nearly Empty Message

Check printed pages, page counter, and display messages periodically. If the ■ indicator starts blinking (□), the printer has nearly run out of toner or the toner is not evenly distributed inside the cartridge.



*K stands for Black, C stands for Cyan, M stands for Magenta and Y stands for Yellow.

Although you can print approximately 300 (Black) and 500 (Cyan, Magenta and Yellow) additional pages (at 5% coverage) after the toner low message first appears, be sure to replace the toner cartridge with a new one before it becomes completely empty. When this occurs, the ■ indicator on the LCD panel will disappear.

Toner Empty Message

When the following messages appear on the LCD panel and the printer stops printing, you need to replace the Toner Cartridge(s):

```
16 TONER EMPTY

K COLOR
```

Replacing the Toner Cartridges

> **Caution**
> When replacing the Toner Cartridges, handle them carefully so that toner does not spill.

> **Note**
> To ensure optimum print quality, use genuine Brother toner cartridges. Third party toner cartridges may not work in your printer.
> To obtain genuine Brother supplies, consult the dealer where you purchased the printer.

To replace the toner cartridge(s), follow these steps:

1. Open the Front Cover of the printer.

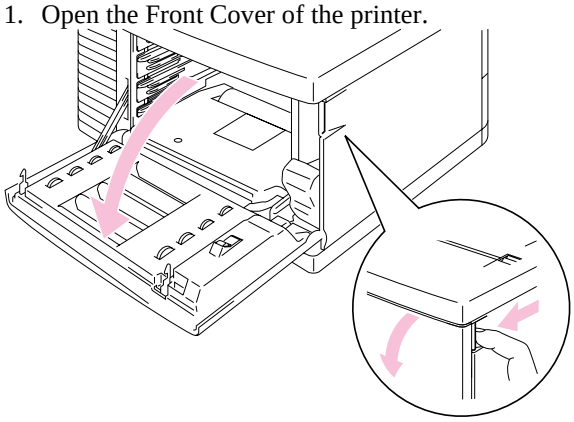


Fig. 5-1 Open the Front Cover

2 Remove the Toner Cartridge(s) which has run out of toner.

3. Take the new toner cartridge out of the box . Remove the tape labeled 'REMOVE'.

4. After rocking each new Toner Cartridge 3 to 4 times from side to side, remove the orange protective cover from the new Toner Cartridge.

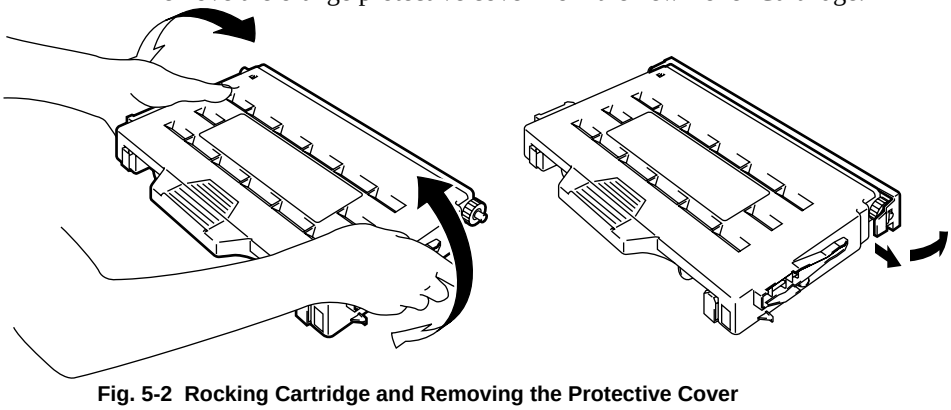


Fig. 5-2 Rocking Cartridge and Removing the Protective Cover

5. Insert the new Toner Cartridge(s) by positioning it in the correct guide(s). Slide it gently into the printer. Do not try to lock or push them in; they must rest loosely in the guide rails. Note that each color cartridge is individually keyed to prevent improper installation. Match each cartridge color label to the corresponding label on the printer.

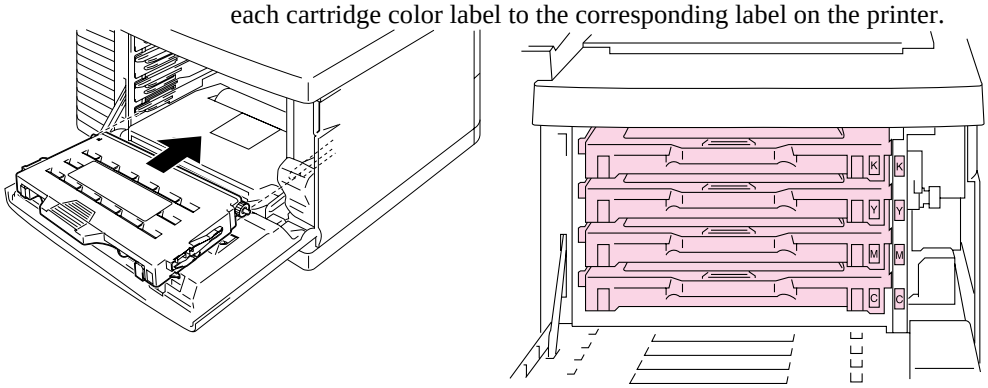


Fig. 5-3 Installing the Toner Cartridges

6. Close the Front Cover.

Caution

- Insert the toner cartridges gently into the printer. Do not try to lock them into the printer by pushing them, they must stay loosely in the guide rails, they will be correctly positioned when the front cover is closed.
- The printer may be damaged or may not work correctly if you install consumables other than genuine Brother supplies or if you use refilled toner cartridges. This could void your warranty.
- Do not stand the toner cartridge on its end or turn it upside down.
- Install the toner cartridges immediately after you remove the protective cover. Do not touch the shaded area shown below: .

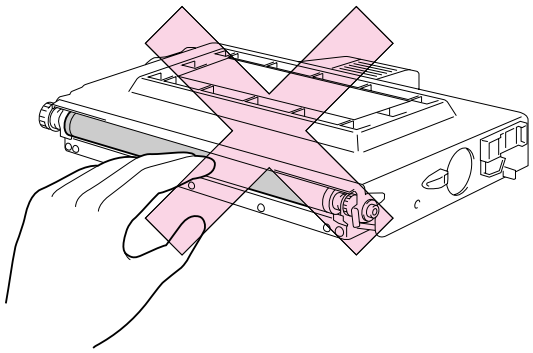


Fig. 5-4 Toner Cartridges

Oil Bottle

Oil Bottle Low Message

When the Oil has almost run out, the following message appears on the LCD panel. Prepare a new Oil Bottle to replace the nearly empty bottle. After this message appears, you can print approximately 30 pages:

```
FUSER OIL LOW
```

Oil Bottle Empty Message

When the Oil completely runs out, the following message appears on the LCD panel and the printer stops printing. When you see this message, you must replace the Oil Bottle with a new one:

```
23 OIL EMPTY
```

Warning

The Fusing Unit and the parts around it are HOT! Be sure to wait until the Fusing Unit has cooled sufficiently before replacing the Oil Bottle.
If you touch the HOT parts, you might get injured.

Caution

Be careful not to spill oil inside the printer, it may cause considerable damage and void your warranty. If you spill some oil, consult your dealer or Brother authorized service representative.

Replacing the Oil Bottle

1. Press the **Power** button to turn off the printer and wait until it has cooled down sufficiently.

2. Open the Top Cover.

3. Release the Oil Bottle Lock Levers as shown below:

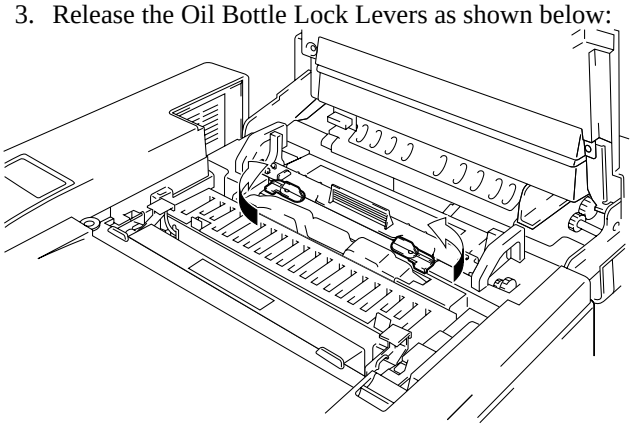


Fig. 5-5 Release the Oil Bottle Lock Levers

4. Remove the empty Oil Bottle from the Fusing Unit. Hold a sheet of paper under the Oil Bottle and lift it out of the Fusing Unit. Move the bottle toward the right hand side of the printer, so that the oil will not spill into it.. Be careful not to spill oil inside the printer. It could cause considerable damage to the printer.

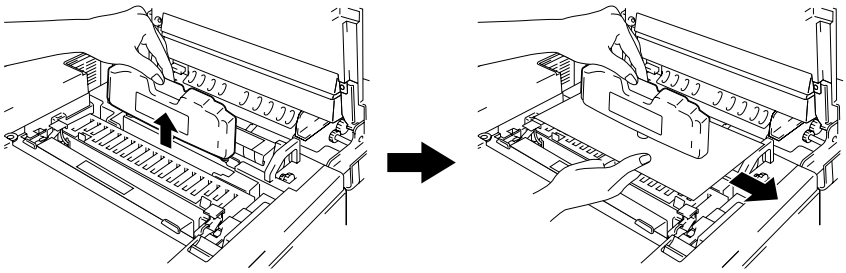


Fig. 5-6 Take the Oil Bottle out

5. Install the new Oil Bottle into the Fusing Unit with the label facing the front of the printer. This will enable the Oil Bottle to fit into the cutout in the top of the Fusing Unit.

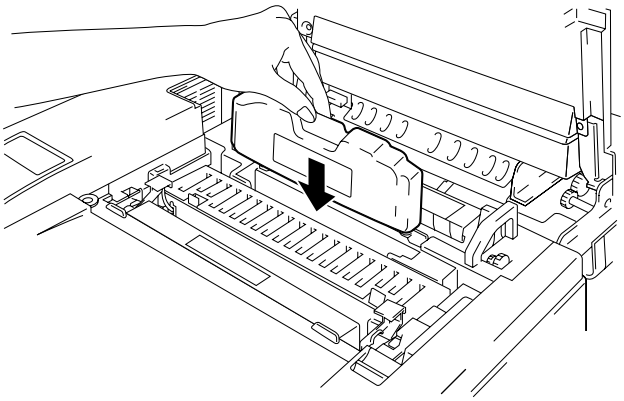


Fig. 5-7 Install the Oil Bottle

6. Lock the Oil Bottle Lock Levers securely.

7. Close the Top Cover.

8. Press the **Power** button to turn the printer On.

Fuser Cleaner

Fuser Cleaner Message

When the following message appears on the LCD panel, you will need a replacement Fuser Cleaner:

```
REPLACE FCR
```

Fuser Cleaner Change Message

When the following message appears on the LCD panel and the printer stops printing, you must replace the Fuser Cleaner:

```
24 CHANGE FCR
```

Replacing the Fuser Cleaner

⚠ Warning

The Fusing unit and the parts around it are HOT! Be sure to wait until the Fusing Unit has cooled sufficiently before replacing the Fuser Cleaner.
If you touch the HOT parts, you might get injured.

1. Press the **Power** button to turn the printer off and wait until it has cooled down sufficiently.

2. Open the Top Cover.

3. Release the Oil Bottle Lock Levers on both sides as shown below:

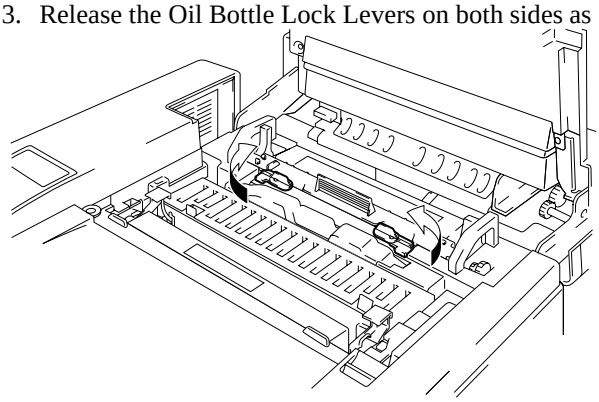


Fig. 5-8 Release the Levers

4. Take the Fuser Cleaner out of the Fusing Unit by holding the handle of the Fuser Cleaner as shown below:

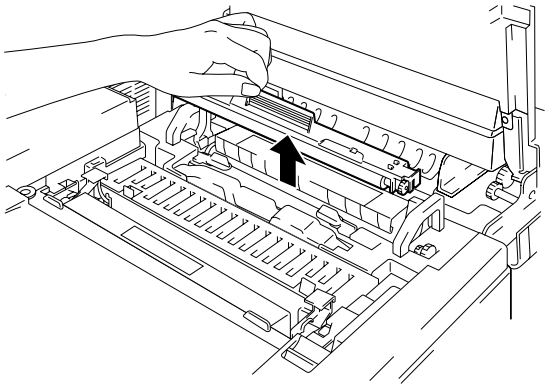


Fig. 5-9 Removing the Fuser Cleaner

5. Install the new Fuser Cleaner into the guide with the roller side facing you.

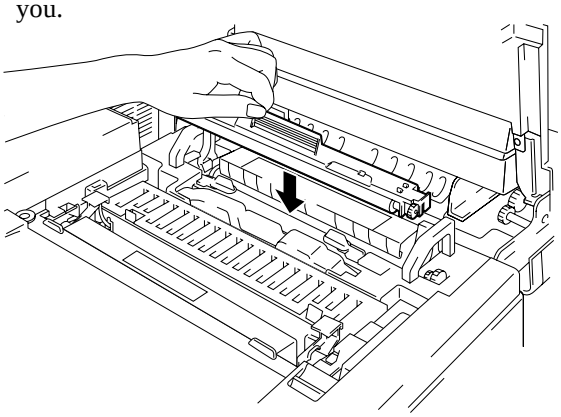


Fig. 5-10 Installing the Fuser Cleaner

6. Lock the Fuser Cleaner with the Oil Bottle Lock Levers.

7. Close the Top Cover.

8. Press the **Power** button and turn the printer On.

9. Press the **Sel** button and take the printer Off Line.

10. Press the **Reset** button while holding down the **Shift** button.

11. When you see "RESET PRINTER" on the LCD panel, press the ▲ (UP) or ▼ (DOWN) button and select "RESET PARTS LIFE". Press the **Set** button and select "FC ROLLER" with the ▲ (UP) or ▼ (DOWN) button.

12. Press the **Set** button, the printer is now On Line.

Waste Toner Pack

Approximately every 12,000 images you print at 5% coverage, you must change the Waste Toner Pack.

Waste Toner Pack Full Message

When the West Toner Pack is full, the following message appears on the LCD panel and the printer will stop printing. When you see this message, you must replace the Waste Toner Pack:

```
22 WASTE TONER
```

Caution

Do not re-use the Waste Toner Pack.

Replacing the Waste Toner Pack

Warning

- **Do not put the Waste Toner Pack into a fire. It could explode.**
- **Be careful not to spill the toner. Do not inhale or allow it to get into your eyes.**

Caution

Be careful when you handle the Waste Toner Pack so that toner will not spill on your hands or clothes.

1. Open the Front Cover.

2. Remove the Waste Toner Pack from the holder located at the lower right side of the printer. Be careful not to spill the toner.

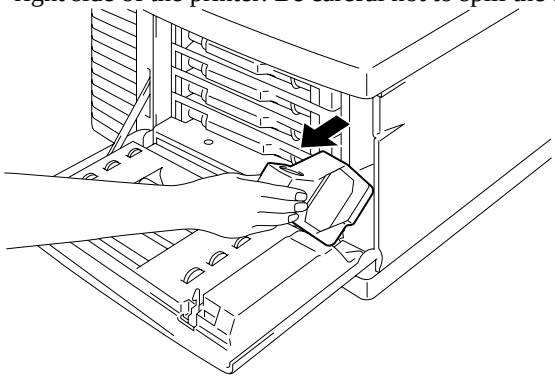


Fig. 5-11 Take the Waste Toner Pack out

3. Peel off the sealing sticker on the left side of the Waste Toner Pack. Seal the opening with the sealing sticker. See Fig. 5-12 for the correct placement of the sticker.
 When you dispose of the used Waste Toner Pack, place it in the plastic bag included with the replacement Waste Toner Pack. Please dispose of the Waste Toner Pack in accordance with local regulations.

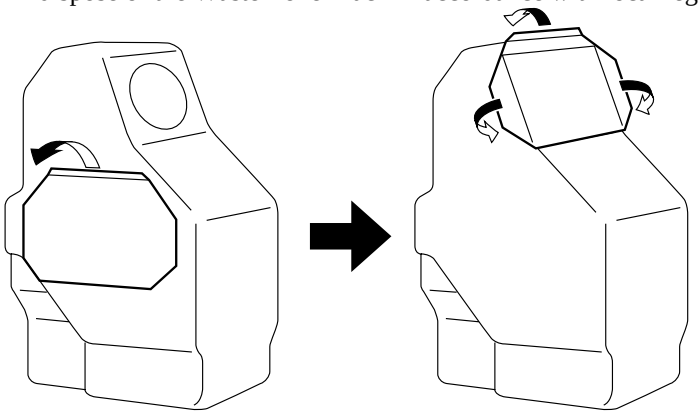


Fig. 5-12 Seal the Sealing Sticker

4. Insert the new Waste Toner Pack into the Waste Toner Pack Holder.

5. Close the Front Cover.

OPC Belt Cartridge

OPC Belt Cartridge Message

When the OPC Belt Cartridge runs out, the following message appears on the LCD panel. When you see this message, you must replace the OPC Belt Cartridge:

```
REPLACE OPC BELT
```

Caution

- Do not touch the surface of the OPC Belt Cartridge. If you touch it, it could degrade print quality.
- Do not expose the OPC Belt Cartridge to light (more than 800 lux) for more than 2 minutes. This could degrade print quality. Be sure to open the printer Front Cover BEFORE you open the Top Cover to handle the OPC Belt Cartridge.
- Damage caused by improper handling of the OPC Belt Cartridge may void your warranty.

Replacing the OPC Belt Cartridge

1. Press the Power button and turn the printer Off.

2. Open the Front Cover and then open the Top cover.

3. Pull the green Belt Cartridge Lock Levers on both sides toward you to release the lock.

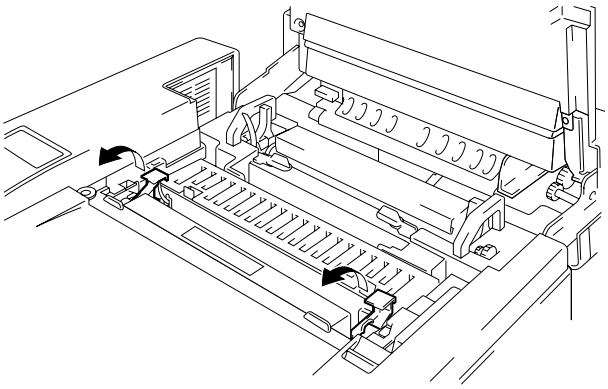


Fig. 5-13 Releasing the Belt Cartridge Lock Levers

4. Remove the OPC Belt Cartridge from the printer.

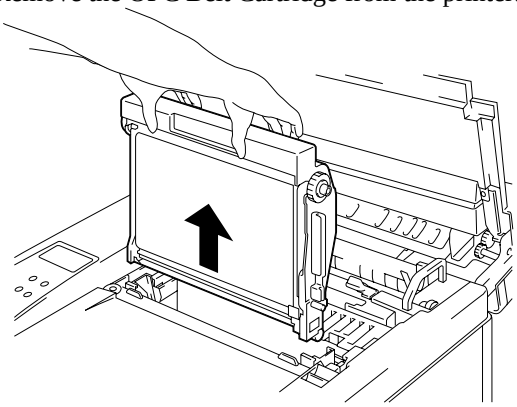


Fig. 5-14 Removing the OPC Belt Cartridge

5. Remove the Tension Release Pins from both sides of the new OPC Belt Cartridge.

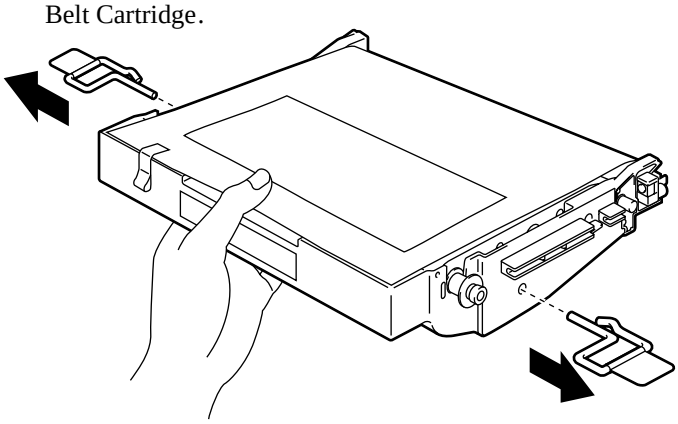


Fig. 5-15 Removing the Tension Release Pins

6. Remove the protective sheet from the new OPC Belt Cartridge. Do not touch the green part of the OPC Belt Cartridge.

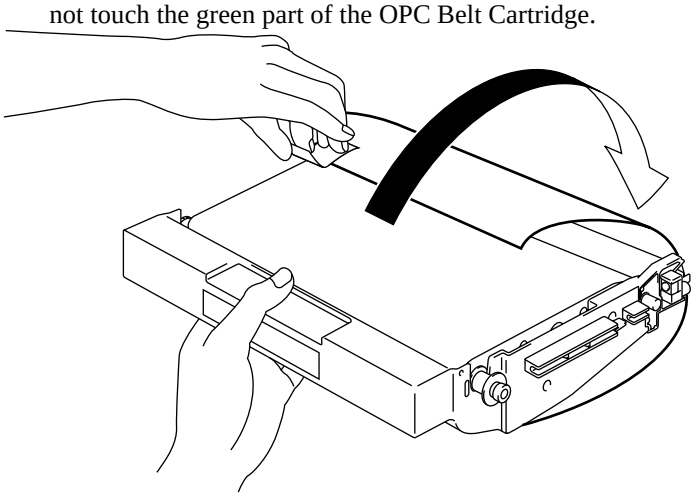


Fig. 5-16 Removing the Protective Sheet

7. Insert the new Belt Cartridge into the printer guides with the flat side facing you.

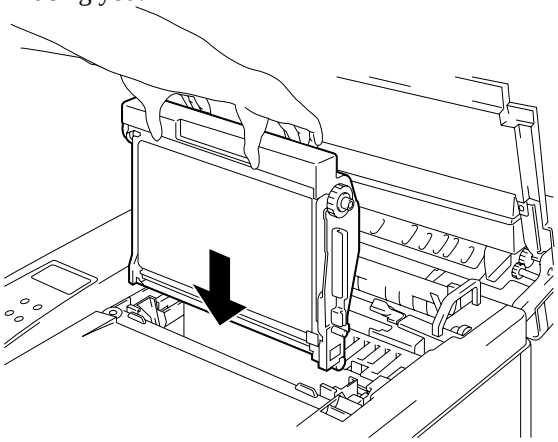


Fig. 5-17 Inserting the new Belt Cartridge

8. Press the Belt Cartridge Lock Levers on both sides of the OPC Belt Cartridge to the rear to lock the cartridge into the printer.

9. Close the Front Cover and the Top Cover.

10. Press the **Power** button and turn the printer On.

11. Press the **Sel** button and take the printer Off Line.

12. Press the **Reset** button while holding down the **Shift** button.

13. When you see “RESET PRINTER” on the LCD panel, press the ▲ (UP) or ▼ (DOWN) button and select “RESET PARTS LIFE” . Press the **Set** button and select “OPC BELT” with the ▲ (UP) or ▼ (DOWN) button.

14. Press the **Set** button, the printer is now On Line.

Ozone Filter

Ozone Filter

You will need to replace the Ozone Filter once a year to prevent ozone from coming out of the printer.

> **Caution**
> You must replace the Ozone Filter once a year. If you do not, it might cause a noticeable smell of Ozone.

Replacing the Ozone Filter

1. Slide and remove the Rear Side Cover.

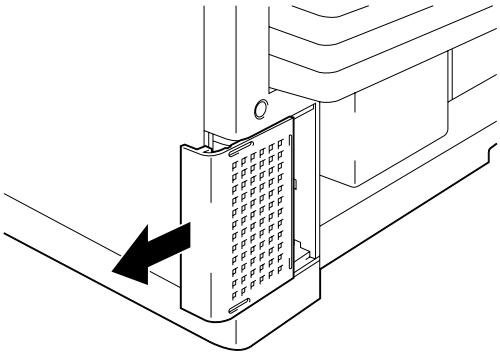


Fig. 5-18 Removing the Ozone Filter Case

2. Remove the Ozone Filter Case from the Ozone Filter Cover.

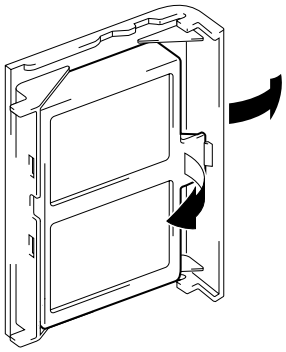


Fig. 5-19 Removing the Ozone Filter

3. Insert the new Ozone Filter Case into the Ozone Filter Cover.

4. Reinstall the Rear Side Cover by sliding it into place.

Fusing Unit

Fusing Unit

When the following message appears on the LCD panel, you must replace the Fusing Unit:

```
REPLACE  FUSER
```

⚠ Warning

The Fusing Unit and the parts around it are HOT!. Be sure to wait until the Fusing Unit has cooled down sufficiently before replacing the Fusing Unit.
If you touch the HOT parts, you might get injured.

⚠ Warning

After replacing the Fusing Unit, wait for approximately 30 minutes before printing after the new unit is installed to allow the fusing oil to circulate.

Replacing the Fusing Unit

1. Press the **Power** button and turn off the printer. Unplug the printer. To avoid injury wait until the printer has cooled down sufficiently before replacing the Fusing Unit.

2. Open the Top Cover and the Rear Access Cover.

3. Remove the screws as shown below (Fig. 5-20) inside the Rear Access Cover and release the metal retaining clips.

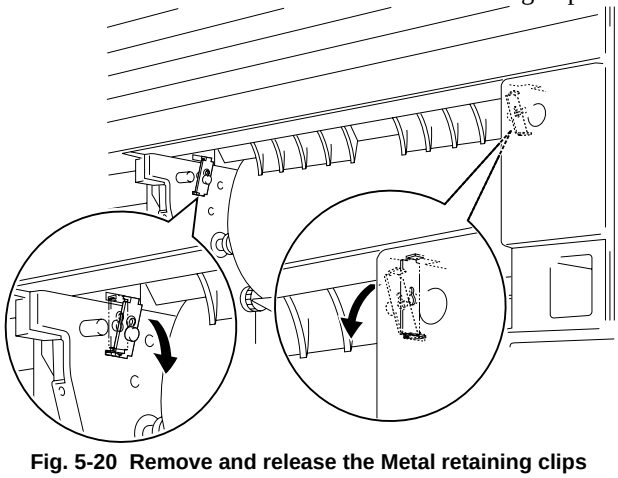


Fig. 5-20 Remove and release the Metal retaining clips

Note
If you begin using a new Fusing Unit immediately, poor print quality may result. **Please wait for 30 minutes after installing a new Fusing Unit to allow the oil to circulate completely through to the Heat Roller**.

4. Remove the Fusing Unit from the printer by holding the handles on both sides.

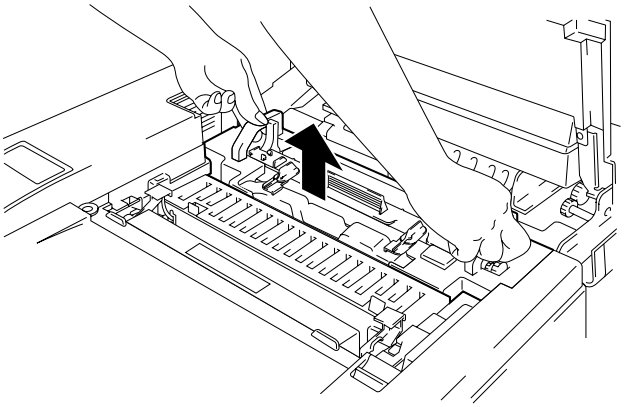


Fig. 5-21 Removing the Fusing Unit

Caution
When removing the Fusing Unit from the printer, be sure to keep the Fusing Unit flat, so oil will not spill. Considerable damage can occur if oil is spilled inside the printer.

5. Remove the Oil Bottle and the Fuser Cleaner from the Fusing Unit.

6. Install the new Fusing Unit into the printer. Be sure to insert the Fusing Unit completely into the printer.

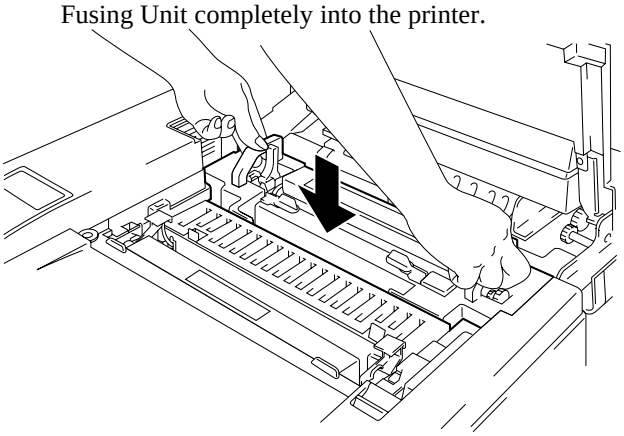


Fig. 5-22 Installing the New Fusing Unit

7. Place the retaining clips into the holes in the Fusing Unit and secure them with the two screws.

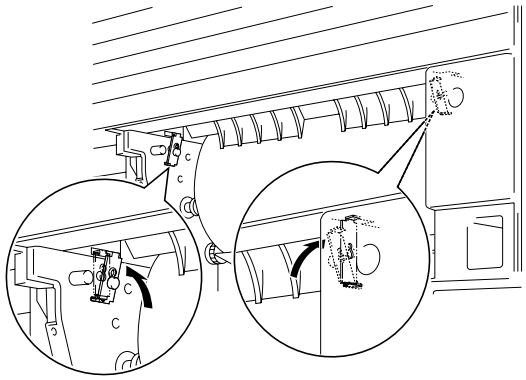


Fig. 5-23 Secure the retaining clips

8. Release the Fusing unit by pushing the Pressure Release Levers to the OPEN position (①). Remove the orange protective parts fitted between the rollers of the Fusing Unit (②). Make sure that the Pressure Release Levers are put back to the SET position. .

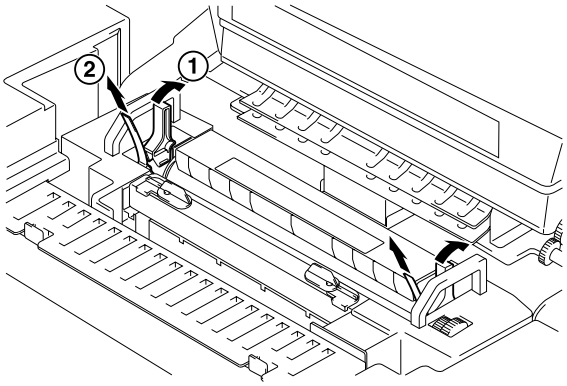


Fig. 5-24 Removing the Protective Parts

9. Install the Fuser Cleaner and the Oil Bottle into the new Fusing Unit and Lock the Oil Bottle Lock Levers. Be careful not to spill oil inside the printer. This could damage the printer.

10. Close the Top Cover.

11. Plug the printer into the AC outlet.

Note
If the condition of the Fuser Cleaner is poor, we recommend that you replace the Fuser Cleaner at the same time as the Fusing Unit. The life counter for the Fuser Cleaner will also need to be reset. Please refer to page 5-10 for instructions.
Partially used Oil Bottles can be reused with a new Fusing Unit.
Please wait for 30 minutes after installing a new Fusing Unit to allow the oil to circulate completely through the Heat Roller.

12. Press the **Power** button and turn on the printer.

13. Press the **Sel** button and take the printer Off Line.

14. Press the **Reset** button while holding down the **Shift** button.

15. When you see "RESET PRINTER" on the LCD panel, press the ▲ (UP) or ▼ (DOWN) button and select "RESET PARTS LIFE" . Press the **Set** button and select "FUSER UNIT" with the ▲ (UP) or ▼ (DOWN) button.

16. Press the **Set** button, the printer is now On Line.

Caution

Please be careful when replacing the Fusing Unit. Do not place pressure on the Fusing Unit; it should fit in easily. If it does not, make sure the Fusing Unit connector is free to move.
Do not apply force! It could damage both the Fusing Unit and the printer.

120K Kit

120K Kit

When you see the following message on the LCD panel, you must replace the items located in the 120K Kit, which includes the Drum Cleaner, Paper Discharger, Transfer Roller, Paper Feeding Roller, Separator Pad and the Transfer Drum.

Note

- User replacement of some of the following 120K Kit parts *is not recommended.*
- For user replacement of the Drum Cleaner, Paper Discharger and Transfer Roller, please refer to the instructions found below.
- We recommend that you contact your local Brother authorized dealer or service center for replacing the Paper Feeding Roller, Separator Pad and Transfer Drum.
- We recommend you contact your Service provider when you see the following message on the LCD panel:

```
REPLACE 120K KIT
```

Drum Cleaner

Caution

Both ends of the Drum Cleaner roller consist of metal bearings that connect the bias element to the power supply. These must be connected correctly when you install the Drum Cleaner. Be sure to check how to connect these properly by referring to the old Drum Cleaner before you begin replacement.

Replacing the Drum Cleaner

1. Press the **Power** button and turn the printer Off.

2. Open the Top Cover.

3. Remove the Drum Cleaner Cover.

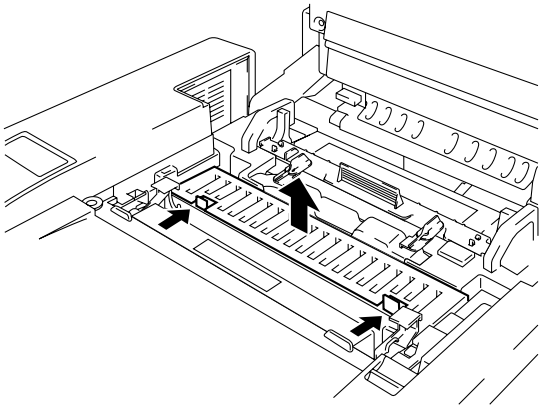


Fig. 5-25 Opening the Cover

4. Remove the Drum Cleaner by gently pushing the handle away from you until it releases and then lift it out of the printer.

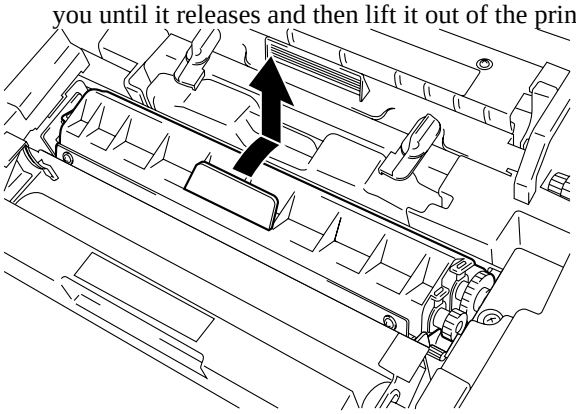


Fig. 5-26 Removing the Drum Cleaner

5. Install the new Drum Cleaner into the printer by gently placing the brass bearings into the guides and pushing the handle down until the bearings click into place. Ensure that the Drum Cleaner is free to move slightly upwards (rotating slightly around the bearings) in the housing after you have installed it.

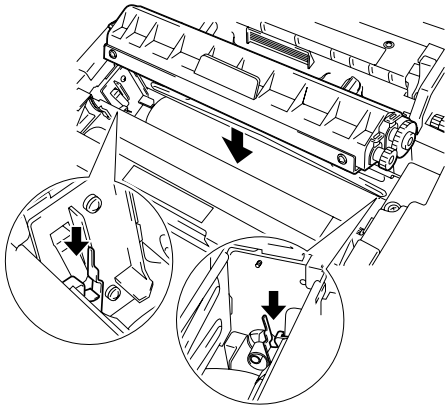


Fig. 5-27 Installing the New Drum Cleaner

6. Re-install the Drum Cleaner Cover and close the Top Cover.

Paper Discharger

Caution

Do NOT touch the charging wire!

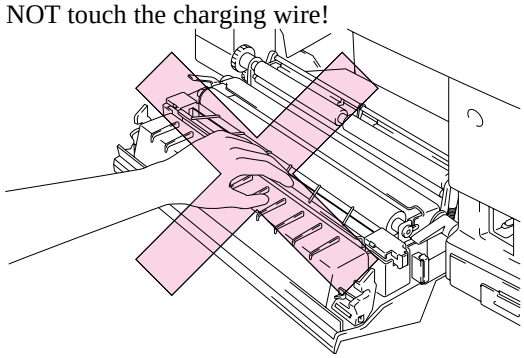


Fig. 5-28 Charging Wire

Replacing the Paper Discharger

1. Open the Rear Access Cover.

2. Remove the Paper Discharger from the Transfer Unit by lightly pressing it down and then sliding it to the right to release it from the catches. Hold the right hand side of the Discharging Unit and lift it upward to remove it.

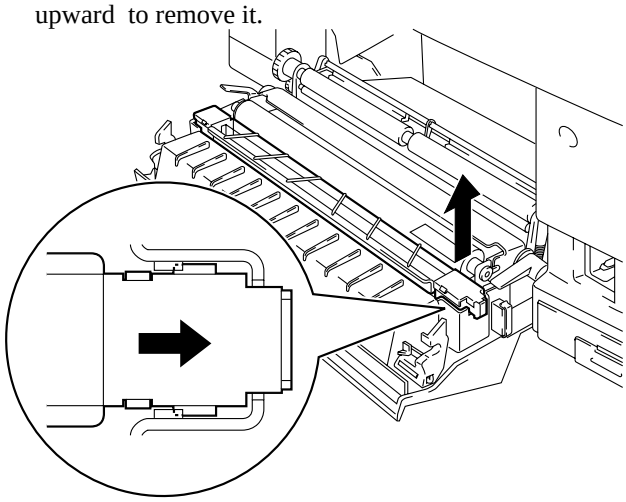


Fig. 5-29 Removing the Paper Discharger

3. Install the new Paper Discharger into the Transfer Unit in the reverse order that you removed it.

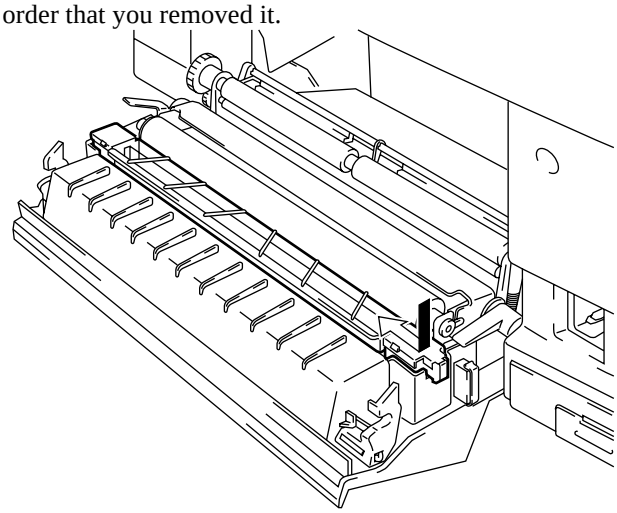


Fig. 5-30 Installing the Paper Discharger

Replacing the Transfer Roller

1. Release the green Transfer Roller Lock Lever and lift the Lever to release the Transfer Roller.

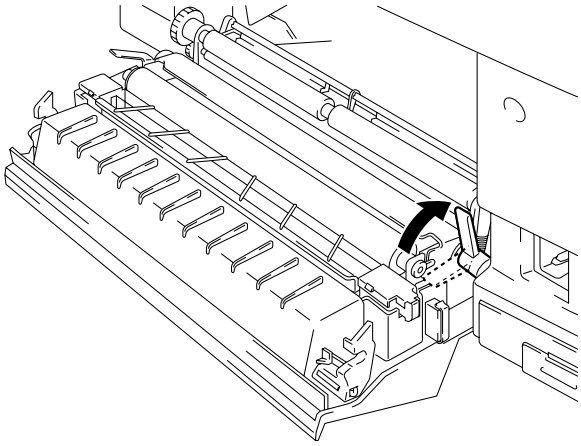


Fig. 5-31 Releasing the Lock Lever

2. Remove the Transfer Roller by gently pulling the right hand side upwards. Slide the Transfer roller to the right to remove it.

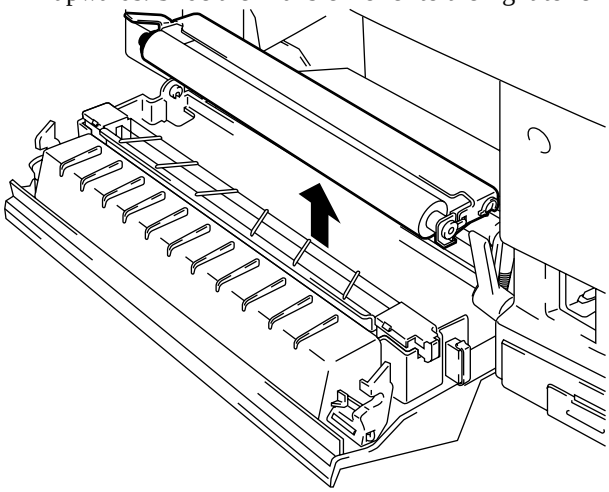


Fig. 5-32 Taking out the Transfer Roller

3. Install the new Transfer Roller by inserting the left side opening of the Transfer Roller into the pin on the left rear side of the unit. Adjust the position of the Lock lever to allow the right side of the Transfer Roller to slip into the holder.

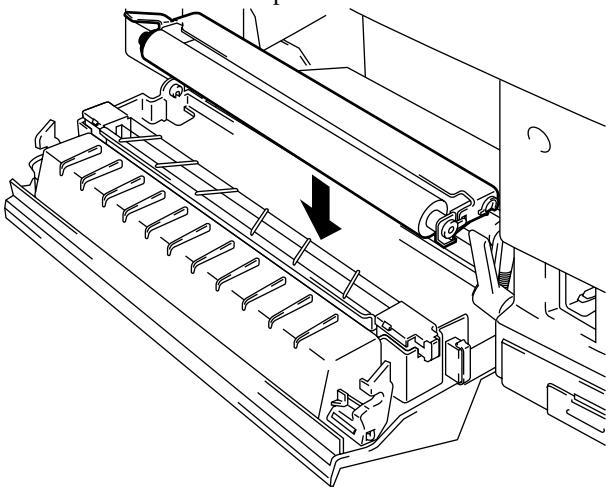


Fig. 5-33 Installing the Transfer Roller

4. Lock the Transfer Roller with the Transfer Roller Lock Lever.

5. Close the Rear Access Cover.

6. Plug the power cord into the power outlet and press the **Power** button to turn on the printer.

Note

- **User replacement of some of these parts by is not recommended.**
- **For replacement of the Paper Feeding Roller, Separator Pad and the Transfer Drum, consult your local dealer/retailer.**
- **Actions 7 to 10 should only be carried out by your dealer or Brother authorized service center when they have replaced the Paper Feeding Roller, Separator Pad and the Transfer Drum.**
- **Replacement of only the Paper Discharger and the Transfer Roller is not a full 120K service and the counter should not be reset until these additional parts are replaced.**

7. Press the **Sel** button and take the printer Off Line.

8. Press the **Reset** button while holding down the **Shift** button.

9. When you see “RESET PRINTER” on the LCD panel, press the ▲ (UP) or ▼ (DOWN) button and select “RESET PARTS LIFE” . Press the **Set** button and select “120K KIT” with the ▲ (UP) or ▼ (DOWN) button.

10. Press the **Set** button, the printer is now On Line.

CLEANING THE PRINTER

Clean the printer exterior and interior periodically with a dry soft cloth. If the printed page gets stained with toner, clean the printer interior with a dry soft cloth.

Cleaning the Printer Exterior

Clean the printer exterior as follows:

1. Turn off the printer and unplug the power cord.
2. Remove the Media Cassette from the printer.
3. Wipe the printer body with a soft cloth to remove dust.

 Dip the cloth in water and wring it out thoroughly for cleaning.

> **Note**
> Use water for cleaning. Cleaning with volatile liquids such as thinner or benzine will damage the surface of the printer.
> Do not use cleaning materials that contain ammonia. They could damage the printer, particularly the toner cartridges.

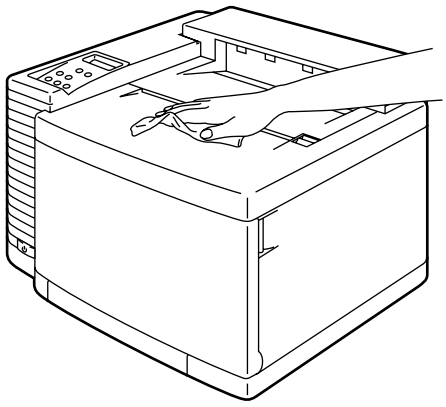


Fig. 5-34 Cleaning the Printer Exterior

Periodic Printer Cleaning

Every 20,000 pages printed or every 12 months, we recommend cleaning the following parts with a dry cloth.

Clean the Paper Guide and Registration Roller to prevent paper jams.

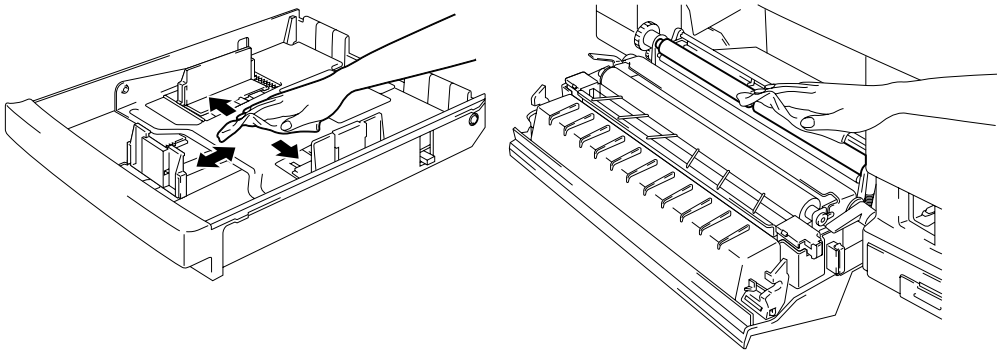


Fig. 5-35 Paper Guide and Registration Roller

Clean the Exit Roller after opening the Top Cover slightly. This will help to prevent paper jams at the paper exit or dirt from appearing on your print output.

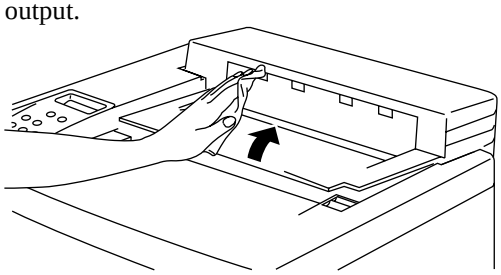


Fig. 5-36 Top cover and Exit Roller

REPACKING AND RELOCATING THE PRINTER

Caution

- **Whenever you transport the printer ALWAYS use the packing materials that were provided with your printer. Follow the steps detailed below to re-pack the printer or the printer may be damaged. This will void the printer's warranty.**
- Before you ship or move the printer, be sure to take out the following items and put them in separate bags (do not put them in the printer carton box):
 * Fusing Unit
 * Waste Toner Pack
 * Toner Cartridges
 * OPC Belt Cartridge
- Remove the Oil Bottle and then use the syringe supplied with the printer to remove Oil from the Fusing Unit tray. . Using a cloth, wipe up any remaining oil that cannot be removed with the syringe.
- Discard the oil according to local regulations.

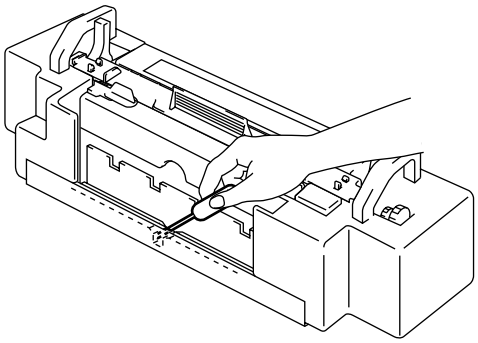


Fig. 5-37 Removing the Oil

How to Repack the Printer

1. Press the **Power** button and turn the printer off. Unplug the printer.

2. Remove the Waste Toner Pack, the Toner Cartridges, the Fusing Unit and the OPC Belt Cartridge from the printer. Place them in their original packaging. **Do not place them together with the printer in the printer carton**.

3. Place the printer in its original packing material and in the original carton.

4. Close the carton and tape it securely.

OPTIONS

Lower Tray Unit

Loading Paper from the Lower Media Cassette

The lower tray unit is a device that functions as a second paper source. It can hold a maximum of 250 sheets of paper (160 g/m^2 or 43 lbs). To purchase the optional lower tray unit, please consult the dealer where you purchased the printer.

With the lower tray unit installed, load paper into the lower paper cassette in the same way as you do the upper media cassette.

How to Install the Lower Tray Unit

Warning

- **This printer is heavy and weighs approximately 37kg (81.6 lbs). When moving or lifting this printer, be sure to do so with at least 2 people to avoid injury.**
- **Be sure to lift the printer using the handholds located at the bottom four corners of the printer.**

Caution

When moving or lifting this printer, be sure to keep the printer flat. Also, you must first remove the Toner Cartridges, Waste Toner Pack, Oil Bottle and Fusing Unit to avoid spills.

1. Place the Lower Tray Unit on a flat table.

2. Remove both side covers from the Lower Tray Unit.

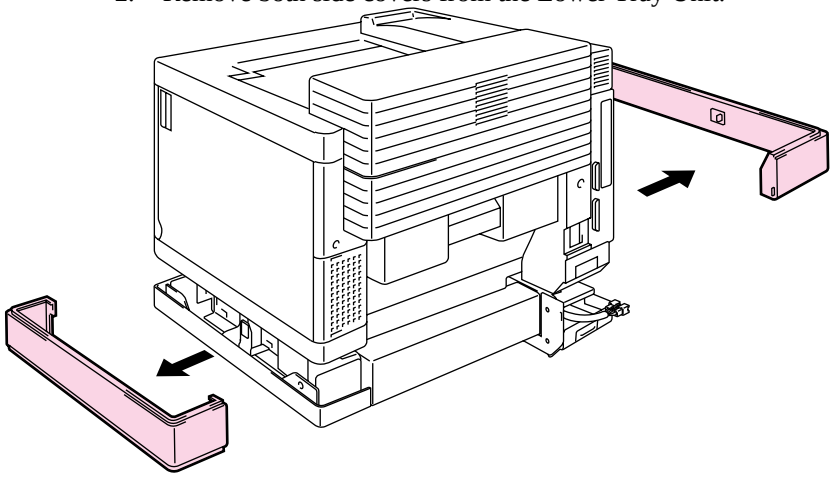


Fig. 5-38 Remove the Covers

3. Pull out the connection cable located at the left rear side of the Lower Tray Unit.

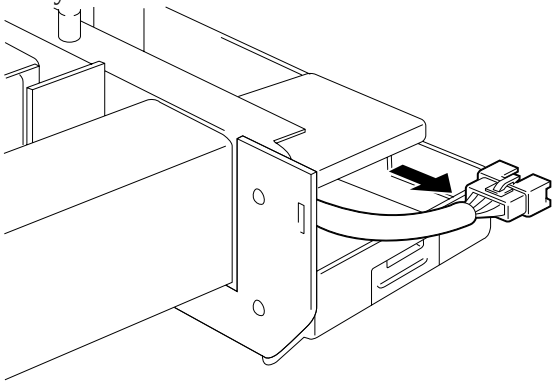


Fig. 5-39 Pulling out the Connection Cable

4. Check the three alignment pins on the Lower Tray Unit. Use two people to lift the printer and place it onto the Lower Tray Unit. Be sure to use the handholds located at the bottom four corners of the printer. Check to ensure that the pins align correctly into the printer.

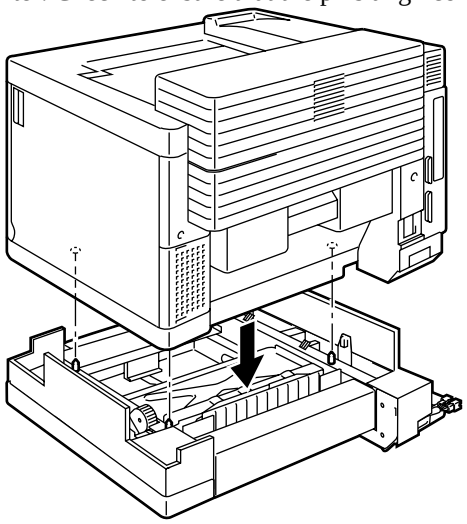


Fig. 5-40 Place the Printer on the Lower Tray Unit

5. Insert the Metal Clips into both sides of the Lower Tray Unit and secure with screws.

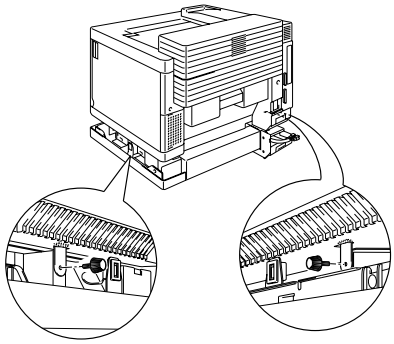


Fig. 5-41 Inserting the Metal Clips and Securing with Screws

6. Remove the Connector Cover of the printer.

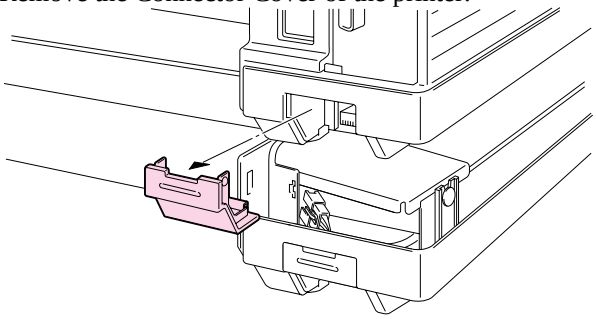


Fig. 5-42 Remove the Cover

7. Insert the connection cable into the printer's connector.

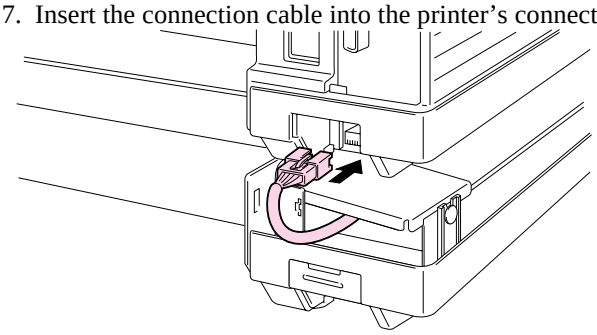


Fig. 5-43 Inserting the Connection Cable

8. Remove the Connector Cover of the Lower Tray Unit and fit it to the printer so that it covers the connector part. Fit the Connector Cover of the printer to the Lower Tray Unit.

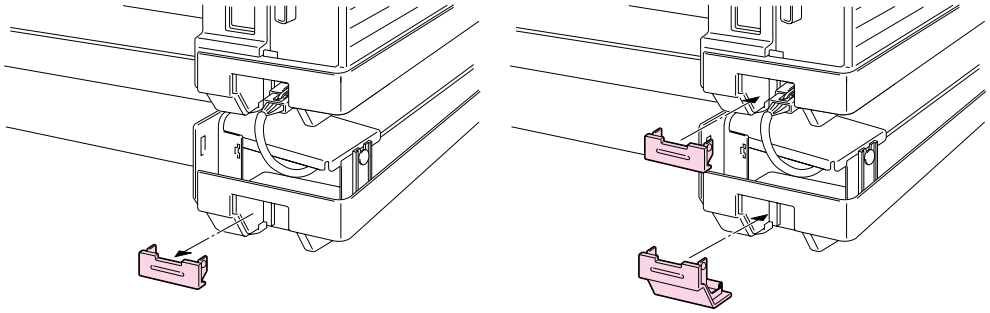


Fig. 5-44 Fit the Covers

9. Install the covers on both sides of the Lower Tray Unit.

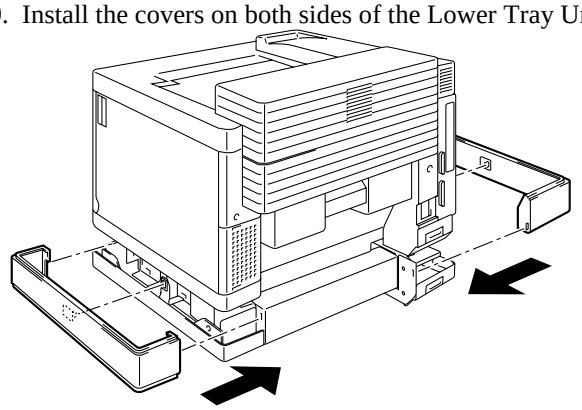


Fig. 5-45 Installing the Cover

> **Note**
> Do not load B5 or smaller size paper and envelopes in the cassette loaded into the optional Lower Tray Unit. It may cause paper jams.

Font Card, Flash Memory/HDD Card

Installing a Font Card, Flash Memory Card and HDD Card

This printer has two slots for an optional font cartridge and one slot for an optional font card, flash memory card or HDD card. (Type III HDD cards will only fit into card slot 2.)

If you have installed optional font card(s), you can use the fonts stored in them as well as the resident fonts. For optional font cards, consult the dealer where you purchased the printer.

If you have installed an optional flash memory card or HDD card, you can save macros and fonts on it. For flash memory card and HDD card operations and information, see "DEVICE OPERATION" in Chapter 4.

Notes

- Do not install or remove cards with the power on, or you may lose all data and may seriously damage the card.
- For more information about these cards, consult the dealer where you purchased the printer.
- For the latest information: **http://www.brother.com**

Follow these steps to install or remove a cartridge/card:

1. Make sure the printer is turned off.

 If the printer is turned on, be sure to press the **Sel** button to take the printer off-line. If data remains in the printer memory, the **Data** LED stays on. Press the **Form Feed** button to print out the remaining data, then the **Data** LED goes off. Turn off the printer.

2. Insert an HDD card into slot 2 with the label facing to the right. It is not possible to fit a card into slot 1 with a Type III PCMCIA card fitted in slot 2.

3. Fit a flash memory or font card into either slot 1 or slot 2 with the label facing to the right. Make sure they are inserted correctly.

 To remove a card, pull it out of the slot with the printer turned off.

The following type of flash memory card can be installed:

- 4 Mbyte : Fujitsu MB98A81273
- 8 Mbyte : Fujitsu MB98A81373
- 16 Mbyte : Fujitsu MB98A81473
- 32 Mbyte : Fujitsu MB98A81573

- 1 Mbyte : AMD AMC001CFLKA
- 2 Mbyte : AMD AMC002CFLKA
- 4 Mbyte : AMD AMC004CFLKA
- 10 Mbyte : AMD AMC010CFLKA

- 4 Mbyte : AMD AMC004DFLKA
- 8 Mbyte : AMD AMC008DFLKA
- 20 Mbyte : AMD AMC020DFLKA

- 2-85 Mbyte : SanDisk PCMCIA PC Card ATA

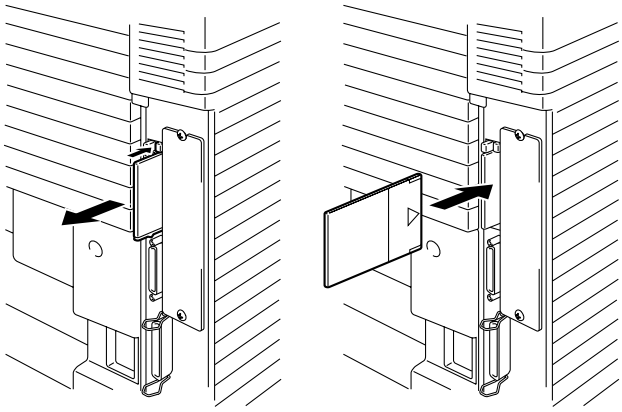


Fig. 5-46 Installing or Removing the Card

Selecting the Optional Fonts

After you have installed the optional font card, you can select optional fonts by any of the following methods:

1. Through your application software
2. With a font selection command
3. With the **Font** button

When you select fonts through your application software, follow the instructions specific to your software. Refer to your software manual if you need assistance. When you select fonts with a font selection command, embed the font selection command in your program. See the Technical Reference Manual, which is optionally available for this printer.

> **Notes**
> When you select the fonts through your software or with a command, note the following:
> - You do not need to be concerned about the **Font** button setting. The software or command setting overrides the button setting.
> - Be sure to install the font card that has your desired fonts. The printer automatically selects the font that has exactly the same or similar characteristics as those you set through the software or with a command. If the installed font card happens to have a font of similar characteristics, the printer will print in an unexpected font.

To select fonts with the **Font** button, follow these basic steps:

1. Print the list of optional fonts in the PRINT FONTS C mode with the **Shift** and **Test** buttons.

2. Find the font slot and font ID number on the list.

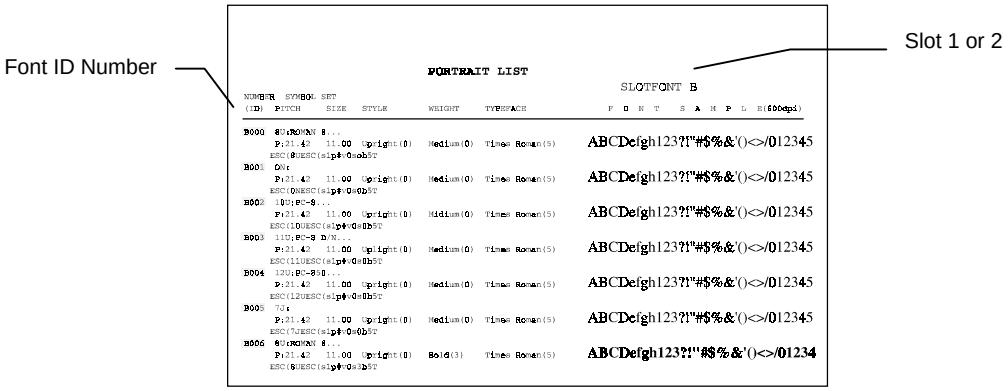


Fig. 5-47 Font ID Numbers on the Font List

3. Select the font with the **Font** button.

 See "FONT button" in Chapter 4.

Network Option

NC-3100h

Some models of this printer may include an NC-3100h network card as standard.

Installing NC-3100h enables you to use the printer in the following environments:
(TCP/IP, IPX/SPX, AppleTalk, DLC/LLC, VINES, LAT, NetBEUI)
Also, many useful utilities such as the BR-Admin and the Brother Network Printing software for the administrator are included. For the details of the utilities, see the documentation included on the CD-ROM.

1. Turn off the printer and unplug the power cord from the AC outlet.

2. Unscrew the two screws securing the rear plate of the main controller board. Remove the screws and pull out the main controller board.

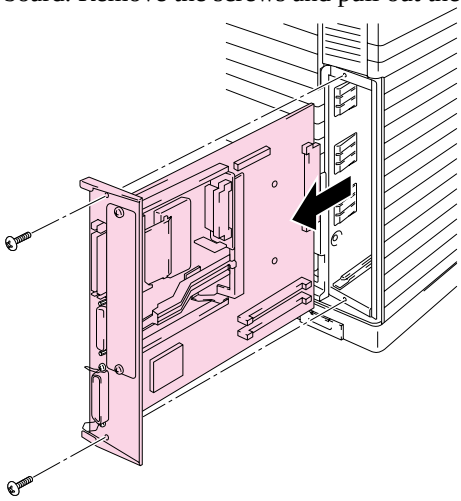


Fig. 5-48 Unscrew the two screws

3. Unscrew the two screws and remove the MIO cover plate.

4. Take the NC-3100h Card out of the box.

5. Insert the NC-3100h connector into the connector between the guide rails and secure with the two screws.

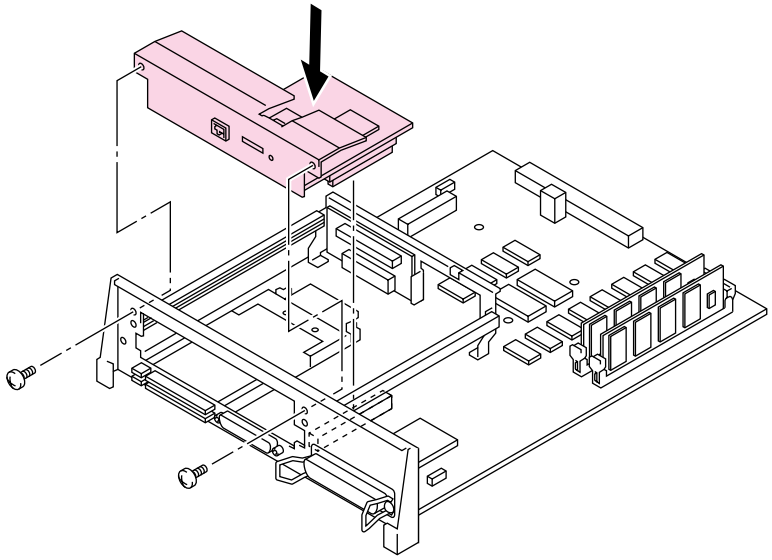


Fig. 5-49 Installing the NC-3100h Controller

6. Secure the NC-3100h with the Lock Bar.

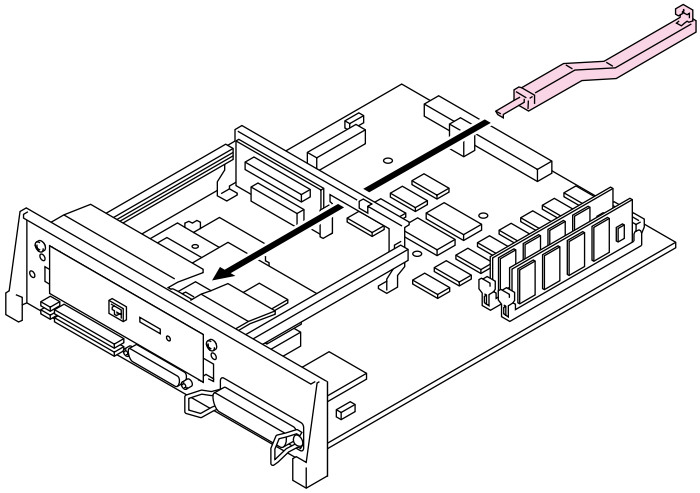


Fig. 5-50 Securing the NC-3100h with the Lock Bar

7. Re-install the main controller board into the printer by sliding it into the guide rails.

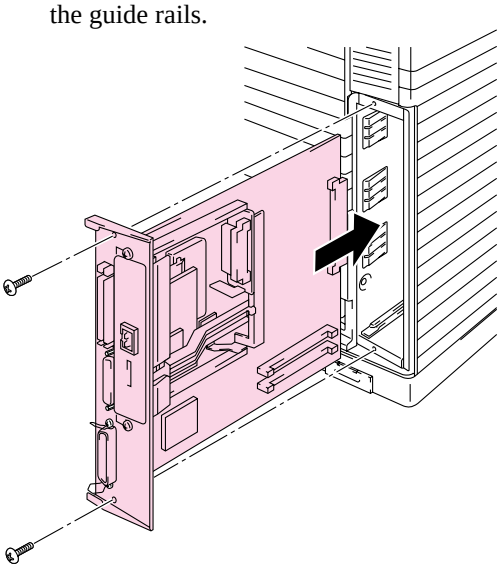


Fig. 5-51 Installing the Main Controller Board

8. Secure the main controller board with the two screws.

9. Connect the network cable to the NC-3100h Card.

10. Connect the AC power cord and turn on the printer.

11. For more details on how to optimize the NC-3100h, please refer to the Network User's Guide supplied with this printer.

Modular I/O Card

Before installing an NC-2010h/2100h Network card, please note the following information.

Before NC-2010h/2100h Installation

(USA)
When you install the NC-2010h/2100h Ethernet interface card, this printer complies with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.
Please refer to the NC-2010h/2100h User's Guide for the FCC notice.

(CANADA)
When you install the NC-2010h/2100h Ethernet interface card, this printer complies with the limits for a Class A digital apparatus, pursuant to Canadian Interference-Causing Equipment Regulations.

(Europe)
When you install the NC-2010h/2100h Ethernet interface card, this printer complies with EN 55022 Class A.

> **⚠ Warning**
> **In a domestic environment, the printer used with an NC-2010h/2100h Network card may cause radio interference, in which case the user may be required to take adequate measures to prevent any such interference.**

This printer has a modular input/output (MIO) interface slot on the rear panel. This slot allows you to install a commercial MIO-compatible sharing/network card.

For more information about MIO cards, consult the dealer where you purchased this printer.

To install an MIO card, follow these steps:

1. Turn off the printer and unplug the power cord from the wall socket.

> **Note**
> - Be sure to turn off the power to the printer before installing or removing the MIO card.
> - Be sure to remove the interface cable connector when installing the MIO card.

2. Remove the two screws and cover plate from the MIO interface slot.
3. Unpack the MIO card and hold it by its edge.

> **Note**
> Do not touch the card surface. If static electricity collects, it damages the card.

4. Insert the card until it is securely seated.
5. Secure the MIO card with the two captive screws on the card.
6. Retain the cover plate and two screws removed in 2 in case you want to remove the MIO card later.

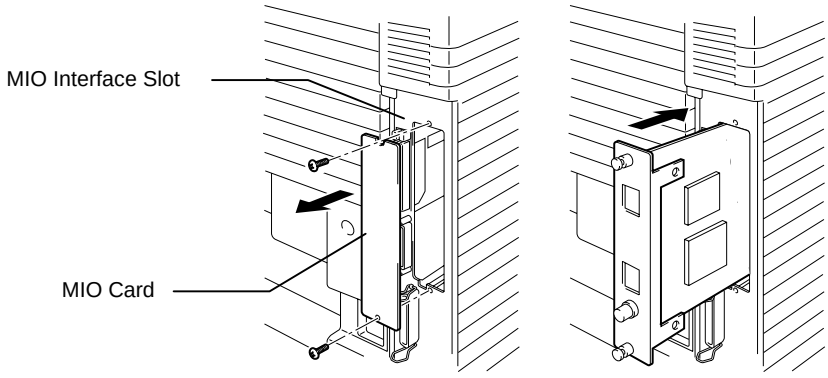


Fig. 5-52 Installing the MIO Card

RAM Expansion

This printer has 32 Mbytes of memory standard and 2 slots for optional expansion memory. The memory can be expanded up to 288 Mbytes by installing commercially available dual in-line memory modules (DIMMs). (The standard memory fitted can vary depending on the printer model and country.)
This printer uses memory modules which are:-
100 pins, no-parity, SDRAM with 64Mbit or more.
This printer is not compatible with Extended Data Output (EDO) DIMM, or DIMM which uses 16Mbit SDRAM.

The following capacity of DIMM can be installed:

- 16 Mbyte TECHWORKS PM-HP 16M-BR
- 32 Mbyte TECHWORKS PM-HP 32M-BR
- 64 Mbyte TECHWORKS PM-HP 64M-BR
- 128 Mbyte TECHWORKS PM-HP 128M-BR

In general, the DIMM must have the following specifications:

Type:	100 pin and 32 bit output
CAS Latency:	2 or 3
Clock Frequency:	66Mhz or more
Capacity:	16,32, 64 or 128 Mbyte
Height:	46mm (1.8 inches) or less
Parity:	NONE
Dram Type:	64 M bit SDRAM 4 Bank

SDRAM can be used.

Notes

- There might be some DIMMs which will not work with this printer.
- For more information, consult the dealer where you purchased the printer.
- For the latest information: **http://www.brother.com**

To install DIMMs, follow these steps:

1. Turn off the printer and unplug the power cord from the AC outlet.

Note

Be sure to turn off the power to the printer before installing or removing the DIMMs.

2. Unscrew the two screws securing the rear plate of the main controller board and pull out the main controller board.

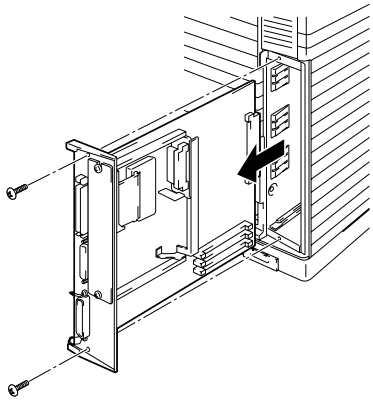


Fig. 5-53 Removing the Main Controller Board

3. Unpack the DIMM and hold it by its edge.

> **Caution**
> Do not touch the memory chips and the surface of the main controller board. If static electricity collects, it may damage these electrical parts.

4. Hold the DIMM with your fingers against the side edges and thumb against the back edge. Align the notches on the DIMM with the DIMM slot. (Check that the locks on each side of the DIMM slot are open, or outward.) .

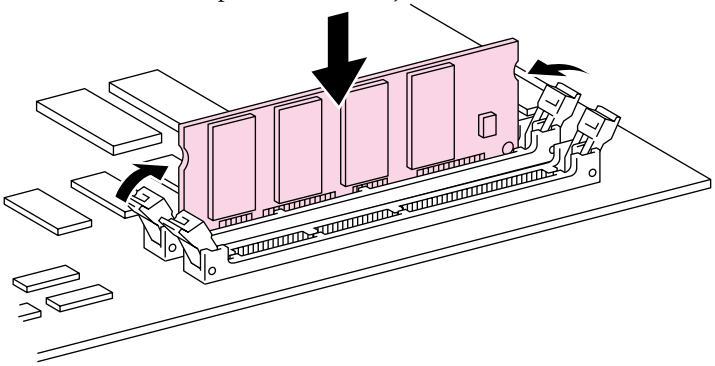


Fig. 5-54 Install the DIMM

5. Press the DIMM straight into the slot (press firmly). Make sure the locks on each side of the DIMM snap inwards into place. (To remove a DIMM, the locks must be released.)

Notes

- When you install less than two DIMMs, be sure to install them in the order Slot 1and then Slot2.
- When you install different capacities of DIMMs, be sure to install the larger capacity DIMM in Slot1 and smaller capacity DIMM in Slot2.

6. Refit the main controller board into the printer by sliding it into the guide rails.

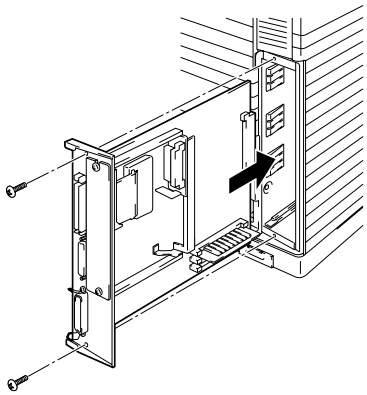


Fig. 5-55 Refit the Main Controller board

7. Secure the main controller board with the two screws.

8. Reconnect the printer cable from your computer. Plug the power cord into the AC outlet and turn on the printer.

9. To check whether the DIMM has been installed correctly, you may perform a Test Print “Print Configuration” that will print the current memory size.

HDD (Hard Disk Drive)

1. Turn off the printer and unplug the power cord from the AC outlet.

2. Unscrew the two screws securing the rear plate of the main controller board and pull out the main controller board.

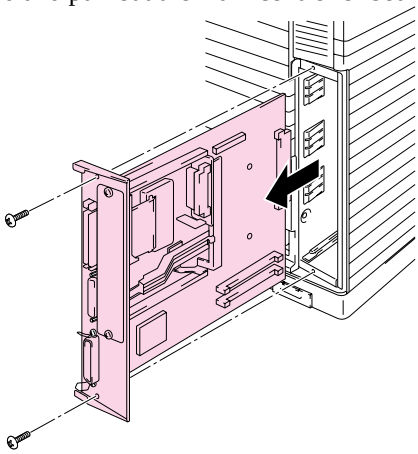


Fig. 5-56 Secure the controller board

3. Insert the 4 pillars into the bottom of the 2.5-inch HDD.

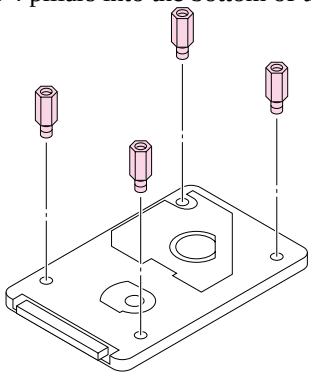


Fig. 5-57 Insert the 4 pillars

4. Connect the cable to the HDD with the keyed side downwards, ensuring it is correctly aligned.

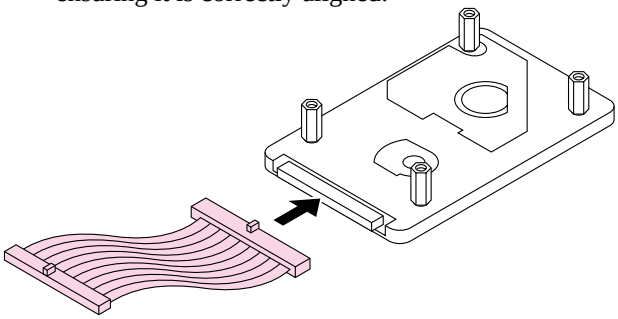


Fig. 5-58 connect the HDD

5. Fit the 4 HDD pillars into the 4 holes of the main controller board, and secure the pillars with the screws provided from the rear of the PCB.

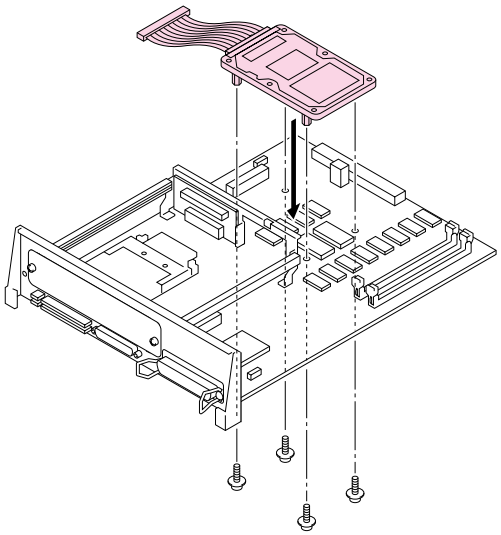


Fig. 5-59 Set the HDD

6. Connect the flat cable to the main controller board.

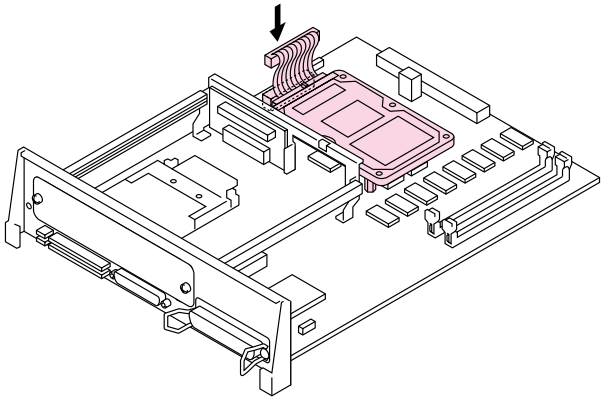


Fig. 5-60 Insert the flat cable

7. Install the main controller board into the printer by sliding it into the guide rails.

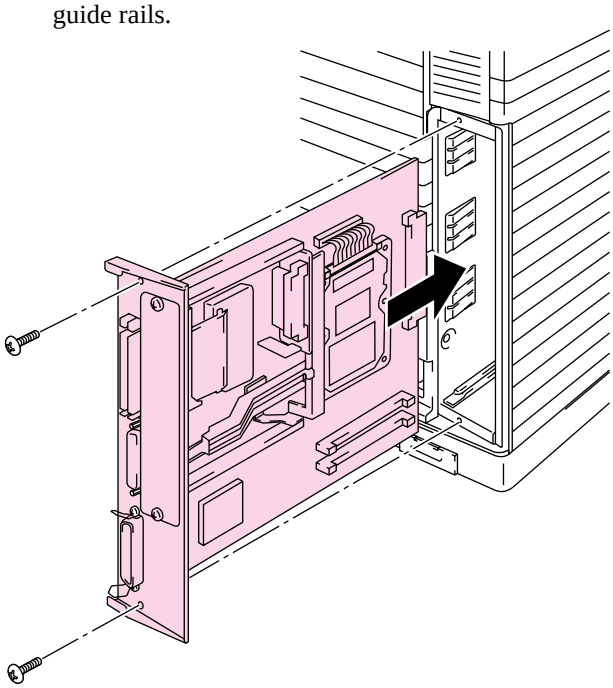


Fig. 5-61 Install the main controller board

8. Secure the main controller board with the 2 screws.

9. Connect the printer interface cable, AC power cord and turn the printer on.

10. Format the HDD from the control panel. See Chapter 4 for details.

CHAPTER 6
TROUBLE SHOOTING

TROUBLESHOOTING

If any problems occur, the printer automatically stops printing, diagnoses the problem, and displays the corresponding message to alert you. Take the appropriate action, referring to the following tables. If you cannot clear the problem, consult the dealer where you purchased the printer. Inform the dealer of the message number for quick troubleshooting.

Operator Call Messages

When any of the following messages appear, the printer stops operating.

Operator Call Message	Meaning	Action
CHECK XXXXXXX	Check the paper tray. XXXXXXX is TRAY 1/ TRAY 2.	Check that the paper is correctly inserted in the tray when the CHECK TRAY 1 message appears. Load a stack of paper into the cassette.
12 COVER OPEN FRONT	The Front cover of the printer is open.	Close the Front cover.
12 COVER OPEN TOP	The Top cover of the printer is open.	Close the Top cover.
12 COVER OPEN REAR	The Rear Access cover of the printer is open.	Close the Rear Access cover.
13 JAM XXXXXX	Paper is jammed in the printer. XXXXXX is DRUM/ TRAYS/ INSIDE/ REAR.	Remove the jammed paper from the indicated area. See the 'Paper Jams' section in this chapter.
14 NO CARTRIDGE XXXX COLOR	A toner cartridge is not installed in the printer. XXXX indicates colors.	Install the toner cartridge.
XX NO CASSETTE	The Media Cassette is not installed. XX is T1/ T2.	Install the Media Cassette.
16 TONER EMPTY XXXX COLOR	The printer has almost run out of toner: you may print another 50 pages. (The **Alarm** LED lights at the same time.) XXXX indicates colors.	Remove the toner cartridge, rock it several times at 45°, and install it again or replace the toner cartridge with a new one.

Operator Call Message	Meaning	Action
XX LOAD PAPER ***** SIZE	The wrong size of paper was loaded in the Media Cassette. XX is T1/ T2.	Load the requested size of paper in the Media Cassette and press the **Form Feed** button.
T1 MANUAL FEED ***** SIZE	The printer is requesting you to load paper manually.	Load the requested size of paper on the Standard Media Cassette and press the **Sel** button.
19 CHECK FONT	An error occurred in the optional font card.	Turn off the printer, and re-install or replace the optional font card.
20 FONT REMOVAL	The PCMCIA card was removed while the printer is on-line.	Turn off the printer, install the card, and turn on the printer. The **Continue** button will allow you to temporarily ignore this message.
22 WASTE TONER	The Waste Toner Pack is full.	Replace the Waste Toner Pack with a new one.
23 OIL EMPTY	The Oil in the Oil Bottle is empty.	Replace the Oil Bottle with a new one.
24 CHANGE FCR	It is time to replace the Fuser Cleaner.	Replace the Fuser Cleaner with a new one.
25 NO FUSER UNIT	The Fusing Unit is not installed correctly.	Install the Fusing Unit correctly.
27 NO OPC BELT	The OPC Belt Cartridge is not installed correctly.	Install the OPC Belt Cartridge correctly.
28 NO FC ROLLER	The Cleaning Roller is not installed correctly.	Install the Cleaning Roller correctly.

Maintenance Messages (appear on the lower row)

Error Message	Meaning	Action
FUSER OIL LOW	The Oil in the Oil Bottle is almost empty.	Replace the Oil Bottle.
REPLACE FCR	It is time to replace the Cleaning Roller.	Replace the Cleaning Roller.
REPLACE OPC BELT	It is time to replace the OPC Belt Cartridge.	Replace the OPC Belt Cartridge.
REPLACE FUSER	It is time to replace the Fusing Unit.	Replace the Fusing Unit.
REPLACE 120K KIT	It is time to replace the Drum Cleaner, Paper Discharger, Transfer Roller, Separation pad and Paper feed roller.	Replace the Drum Cleaner, Paper Discharger, Transfer Roller, Separation pad and Paper feed roller.

Error Messages

Error Message	Meaning	Action
32 BUFFER ERROR	Input buffer overflow	Reset the printer or turn off and on the printer.
34 MEMORY FULL	Work memory overflow	Press the **Continue** button to resume printing. If the same error should occur after you press the **Continue** button, turn off the printer. Wait a few seconds, then turn it on again. Reduce the input buffer size. Turn off "KEEP PCL." Add DIMM memory with printer power off. Download font and the fonts saved in the HDD card might cause the error, for these occupy the same work area as the RAM. Memory expansion is recommended in that case.
40 LINE ERROR	Error in the communications circuit	When the serial interface is used, check the communications parameters such as baud rate, code type, parity, and handshake protocols. When the parallel interface is used, check the interface cable connection.
41 PRINT CHECK	Error in communication with the engine controller	Turn off the printer. Wait a few seconds, then turn it on again.

Error Message	Meaning	Action
42 DEVICE1(2/3) FULL	Card in slot 1 or 2 or HDD overflow	Delete unnecessary macros or fonts, or use a new device.
43 DEVICE1(2/3)W ERROR	Card in slot 1 or 2 or HDD write error	Set the write protect button of the card to OFF if it has been set to ON. Use a new card. If the same error occurs, consult your dealer or service provider.
45 MIO ERROR	Error in communication with the MIO card	Install the MIO card correctly.
47 DEVICE1(2/3)R ERROR	Card in slot 1 or 2 or HDD read error	Use a new device. If the same error occurs, consult your dealer or service provider.
IGNORE DATA (BR-Script 2 mode only)	Data is ignored because of an error in the PostScript® language program.	Press the **Reset** button. If the same error occurs, you may need to add optional DIMM memory.

Service Call Messages

When any of the following messages appear on the LCD, turn the printer Off , wait 5 seconds and then turn the printer On again. If this does not clear the problem, consult your dealer or our authorized service representative.

Service Call Message	Meaning	Action
61 PROG ERROR	Program ROM checksum error	Turn off the printer. Wait a few seconds, then turn it on again.
62 FONT ERROR	Font ROM checksum error	Turn off the printer. Wait a few seconds, then turn it on again.
63 D-RAM ERROR	D-RAM error	Turn off the printer. Wait a few seconds, then turn it on again.
66 NV-W ERROR	NV-RAM write error	Turn off the printer. Wait a few seconds, then turn it on again.
67 NV-R ERROR	NV-RAM read error	Turn off the printer. Wait a few seconds, then turn it on again.
68 NV-B ERROR	NV-RAM write / read error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING C3	Engine NV-RAM error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING C4	Engine controller error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING C7	Process timing clock error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING D1	Y switching clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING D2	M switching clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
99 SERVICE 0-9	CPU error	Turn off the printer. Wait a few seconds, then turn it on again.

Service Call Message	Meaning	Action
88 WARNING D3	C switching clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING D4	K switching clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING D5	K,Y switching solenoid error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING D6	C, M switching solenoid error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E1	Developing motor error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E2	Main motor error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E3	Drum error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E4	Toner empty sensor error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E5	Transfer Roller solenoid error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E6	Drum cleaning solenoid error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E7	Drum cleaning clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E8	Fusing Unit clutch error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING E9	Belt marker sensor error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING EL	Erase LED error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING F0	Cooling fan error	Turn off the printer. Wait a few seconds, then turn it on again.

Service Call Message	Meaning	Action
88 WARNING F2	Ozone fan error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING F4	Fuser fan error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING F5	Charge HV unit error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING H0	Fuser thermistor error	Turn off the printer. Wait 15 minutes, then turn it on again.
88 WARNING H2	Fuser temperature error (Warming up time error)	Turn off the printer. Wait 15 minutes, then turn it on again.
88 WARNING H3	Fuser temperature error (On time error)	Turn off the printer. Wait 15 minutes, then turn it on again.
88 WARNING H4	Fuser temperature error (Off time error)	Turn off the printer. Wait 15 minutes, then turn it on again.
88 WARNING L1	Beam detector error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING L2	Scanner motor error	Turn off the printer. Wait a few seconds, then turn it on again.
88 WARNING LL	Laser power error	Turn off the printer. Wait a few seconds, then turn it on again.

Paper Jams

This printer has been designed to be trouble free. However, if a problem should occur, note the display message and take the appropriate action. This section describes the actions to be taken against paper jams and unsatisfactory printouts.

Paper Jam

If paper jams in the printer, it stops printing and displays the following message.

```
13 JAM XXXXXX
```

Note
Do not use the following paper:
- Bent paper
- Moist paper
- Paper that does not meet specifications

Paper may jam in the Media Cassette, inside the printer, at the Rear Access Cover or at the paper exit. Check the jam location and follow the instructions below to remove the jammed paper.

After you have followed the instructions, the printer automatically resumes printing. However, the **Data** LED may come on and the following message may appear on the display:

```
07 FF PAUSE
```

After a paper jam has occurred, data usually remains in the printer memory. The message prompts you to execute a form feed and print the remaining data. Press the **Set** button to continue.

■ Paper Jam at Paper Exit

```
13 JAM REAR
```

If paper has passed behind the Rear Access Cover and a paper jam has occurred at the paper exit, follow the steps below:

1. Open the Top Cover and release the Fusing unit Pressure Release Levers.

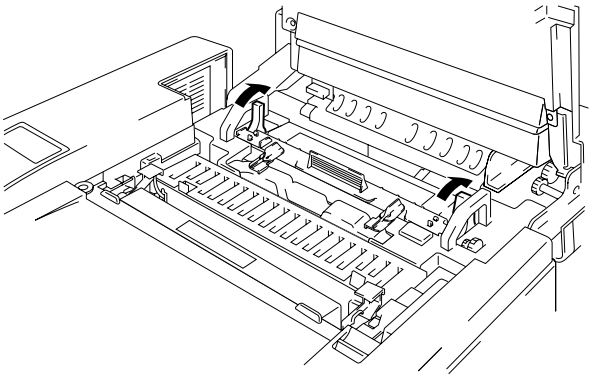


Fig. 6-1 Paper Jam at Paper Exit

2. Open the Rear Access Cover and remove the jammed paper by pulling it out slowly.

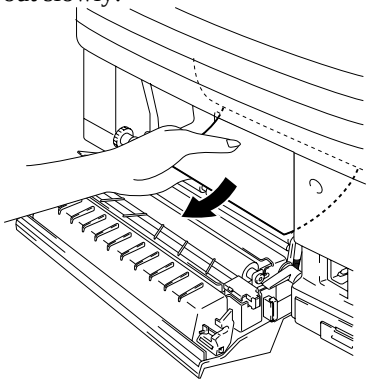


Fig. 6-2 Remove the jammed paper

3. Close the Rear Access Cover.

4. Reset the Fusing unit Pressure Release Levers and close the Top Cover.

> **Note**
> When paper jams at the Rear Access Cover increase, replace the Paper Discharger.

■ Paper Jam at Fusing Roller inside the printer

13 JAM INSIDE	or	13 JAM DRUM

If a paper jam occurs at the Fusing Roller, follow the steps to remove the jammed paper in the same way as for 'Paper Jam at Paper Exit'. Otherwise, follow the steps below:

> **Warning**
> **The Fusing Roller is extremely HOT during operation. Remove the paper carefully.**

1. Open the Rear Access Cover.

2. Remove the jammed paper by holding it with both hands and pulling it slowly toward you.

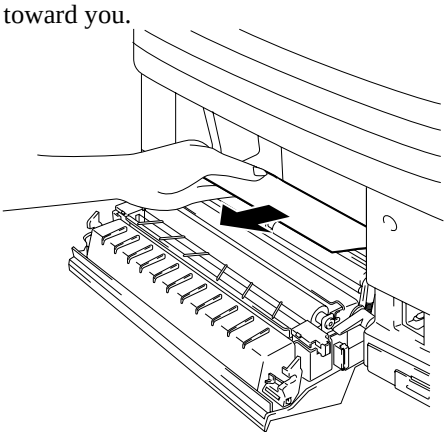


Fig. 6-3 Clearing Inside Paper Jam

3. Close the Rear Access Cover.

Caution

- Do not touch the toner surface of the jammed paper. It might stain your hands or clothes.
- After removing the jammed paper, if the next printed paper is stained with toner, print several test pages before restarting your print job.
- Remove the jammed paper carefully to prevent spreading toner.
- Take care not to stain your hands and clothes. Wash toner stains immediately with cold water.
- Never touch the transfer roller.
- If the edge of print paper is creased, paper jams can occur. To avoid this, please turn the paper over in the media cassette.

■ Paper Jam in the Media Cassette

```
13 JAM TRAYS
```

If a paper jam occurs inside the Media Cassette, follow these steps:

1. Pull out the Media Cassette.

2. Remove the jammed paper.

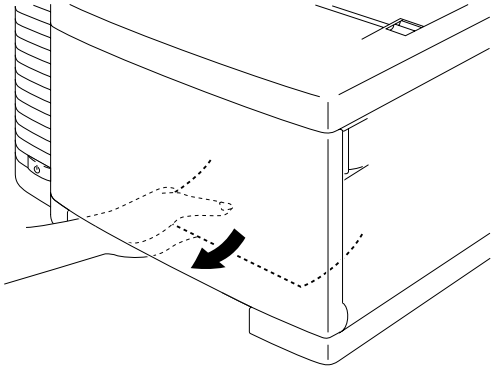


Fig. 6-4 Paper Jam in Media Cassette

3. Re-install the Media Cassette.

Caution

Do not remove the upper Media Cassette while printing from the optional lower Media Cassette. This will cause a paper jam.

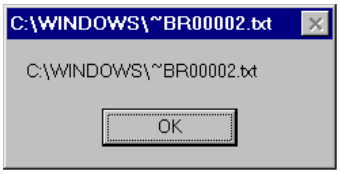
Q & A

This section contains commonly asked questions and the answers concerning your HL-2400Ce printer. If you have encountered a problem, find your question below and follow the recommended steps:

Setting Up the Printer Hardware

Question	Recommendation
The printer does not come on.	Check the following; • The printer is securely plugged into the AC outlet. • The power source is active. • The **Power** button is on.
The printer does not print.	Check the following: • The printer is turned On. • The printer is Online. • All of the protective parts have been removed. • All the covers on the printer are closed. • The toner cartridges are installed properly. • The 'toner empty' message is not displayed on the LCD. If one or more are on, replace the toner cartridges. • The interface cable is securely connected between the printer and computer. • The **Alarm** LED is blinking. If the LED is blinking, refer to the Operator Call section of this manual. • The HL-2400Ce printer is selected in the printer settings in your application. • The host is configured correctly: check printer port, print manager etc. (clear stored job or 'use print manager' is selected off) • There is no jammed paper inside the printer. • Paper is loaded in the Media Cassette. • An Error message is not displayed.

Setting Up the Printer

Question	Recommendation
I cannot print from my application software.	• Make sure the supplied Windows printer driver is installed correctly and selected in your application software.
I cannot print the entire page.	• Check to see if the size of paper in the feeder is the same as the one that you have selected in your application or the printer driver. • Check to see if the interface cable is connected to the printer and computer securely.
Computer indicates a device time-out.	• If the **Alarm** LED is blinking, clear it referring to the 'Alarm Indications at a Glance' section in this chapter and try to print again. • If the **Alarm** LED is off, wait a short while and then click on the Retry button on the PC screen dialog box. Check to see if the printer is On-line
Computer indicates Paper Empty.	Paper is empty. Load paper in the Feeder and push the **On Line** button to recover from the error status..
Computer indicates Off Line	Press the **On Line** button to make the printer ready.
Computer indicates Power Off	Check if the printer is securely plugged into the AC outlet and the **Power** button is On.
Computer indicates an error message other than above.	Check the following; • The computer can work in bi-directional mode. • The printer port is correct. • Selection of the printer is correct. • Recommended interface cable is being used.(IEEE 1284 compliant) Or select the 'Control' tag in the driver and set the 'Status Monitor' to off.
If you install the printer driver for your HL-2400Ce from the Plug & Play installation, the installation may sometimes fail with the following error dialog. 	Please reinstall the printer driver by clicking the 'Add Printer' icon on the Settings-Printer dialog.

Paper Handling

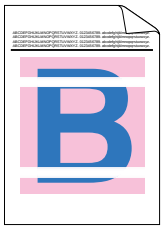
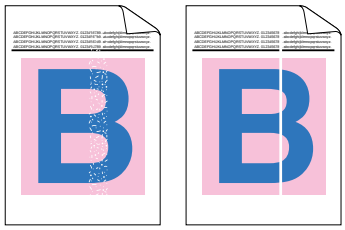
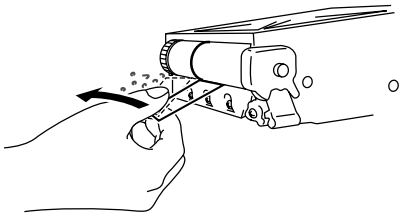
Question	Recommendation
The printer does not load paper.	• Check to see if the **Alarm** LED is on. If so, the Media Cassette may be out of paper or not properly installed. If it is empty, load a new stack of paper into the Media Cassette. • If there is paper in the Media Cassette, make sure that it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and replace it in the paper tray. • Reduce the stack of paper in the Media Cassette, then try again.
How can I load envelopes?	You can load envelopes from the Media Cassette. Make sure you adjust the paper guide. Your application software also must be set up correctly to print on the envelope size you are using. This is usually done in the page setup or document setup menu of your software. Refer to your applications manual for further information.
What paper can I use?	See 'Paper Handling' in Chapter 3 for detailed paper specifications.
How can I clear paper jams?	See the "PAPER JAMS" section in this chapter.
The printer loads more than one sheet at a time.	Check to see if: • The paper loaded is all the same type. • Paper that meets the specifications is loaded. • Papers were fanned before loading. • The stack of paper is not too high. • The side guide is not set too tight.
The printer doesn't eject paper.	Set the printer Off-line, then push the **Form Feed** button. Then push the **On Line** button.
Paper loads skewed.	Check the following; • The side guide is adjusted correctly. • The amount of paper you have loaded is correct. Refer to the 'Loading Paper in the Media Cassette' section in Chapter 2.
Sometimes mis-picking of paper from the paper tray or mis-feeding of paper from the paper exit occurs.	Clean the Paper Guide, the Registration Roller and the Exit Roller referring to 'Periodical Printer Cleaning' in Chapter 5.

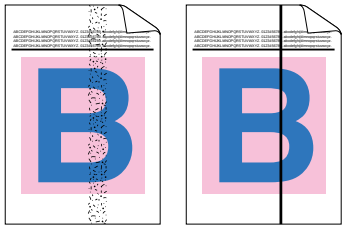
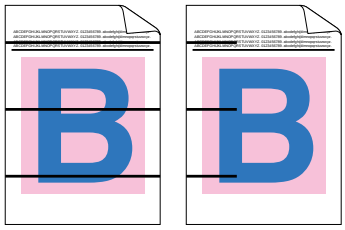
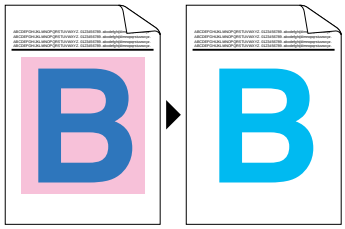
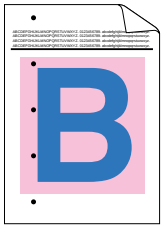
Printing

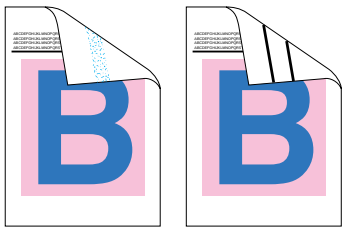
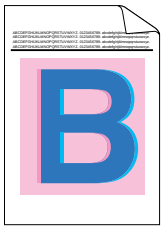
Question	Recommendation
The printer prints unexpectedly or it prints incorrect characters.	• Cancel the print job from your computer. Then, turn on and off the printer or reset the printer and try your print job again. • Make sure your application software is correctly set up to use this printer and check the printer driver settings or printer settings in your application software.
The computer hangs up when the printer starts printing, or an application error occurs.	Check to see if the system resources are enough (PC memory, etc). When you have many applications open, the system resources of your PC will not be enough and your PC will hang up. Close applications you are not using and try again.
My headers or footers appear when I view my document on screen but do not show up when I print them.	Most laser printers have a restricted area that cannot be printed on. Adjust the top and bottom margins in your document to allow for this.
Printing takes too long.	• When you print color graphic images, there is a large amount of data and the printer will take a relatively long time to complete printing. • When you print in Super Fine mode, the printer will take a relatively long time to finish printing. • When the **Data** LED is blinking, the printer is making itself ready to print. Printing speed depends on memory size or performance of your PC and memory size of the printer.
The printer doesn't print in color	• The printer may be set in monochrome mode. • Check that the color toner(s) have not run out.

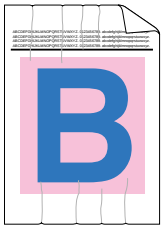
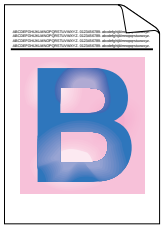
Print Quality

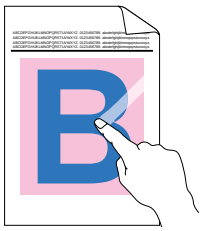
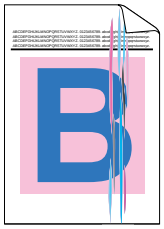
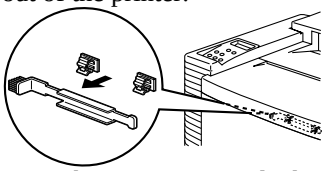
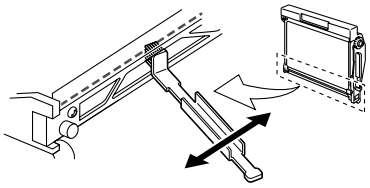
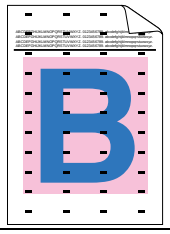
> **Note**
> You can resolve a print quality problem by replacing a toner cartridge with a new one if the LCD indicates the 'toner low' or 'toner empty' message.

Question	Recommendation
White horizontal lines or bands or rubbing 	1) Check the printer is installed on a solid, level surface. 2) Check the rear access cover is closed correctly. 3) Check the toner cartridges are installed correctly. 4) Shake the toner cartridges gently
Colors are light or unclear in the whole page 	1) Check the specified paper is used. 2) Check if the problem is solved after changing the paper to freshly unpacked paper. 3) Check the rear access cover is closed correctly. 4) Shake the toner cartridges gently
White vertical streaks or bands 	Check which color is missing and replace the toner cartridge *The toner has probably come to the end of its life. However, when you see a white vertical line on the toner roller, try the following procedure. 1. Cut a sheet approx. 50mm x 50mm out of a transparency film. 2. Insert the film about 10mm into the gap between the toner roller and the blade. 3. Slide the film and pull it out as shown below. 

Question	Recommendation
Black vertical streaks or bands 	1) Check which color is missing and replace the toner cartridge 2) Replace the OPC belt cartridge
Black (colored) horizontal lines 	Check which color is missing and replace the toner cartridge.
White spots or hollow print 	1) Check if the problem is solved after changing the paper to freshly unpacked paper. 2) Check the specified paper is used. 3) Check the room temperature is higher than 10 degrees C.
Completely blank or some colors are missing 	1) Check which color is missing and check the toner cartridge is installed correctly. 2) Replace the toner cartridge 3) Replace the OPC belt cartridge
Black (colored) spots or Toner stain 	Contact your dealer or Brother authorized service representative.

Question	Recommendation
Toner scatter or Toner stain 	1) Check which color is the problem and replace the toner cartridge 2) Replace the OPC belt cartridge
The color of your printouts are not what you expected	1) Initiate a test print from the control panel. 2) Check that the toner cartridges are installed correctly. 3) Check that toner cartridges are not empty. 4) Adjust the color by using the custom setting in the driver. Colors the printer can display and colors you see on a monitor are different. The printer may not be able to reproduce the colors on your monitor. 5) Check to ensure the specified paper is used.
All one color	Replace the OPC belt cartridge
Dirt on back of paper 	1) Replace the Oil Bottle 2) Replace the Fuser Cleaning Roller
Shade on the transparency	1) Check that the problem is solved after changing to the recommended type of transparency. 2) Check that the media type mode is selected correctly
Color misregistration 	1) Check that the OPC Belt Cartridge is installed correctly. 2) Replace the OPC Belt Cartridge

Question	Recommendation
Uneven density appears periodically in the horizontal direction 	1) Check that the toner cartridges are installed correctly. 2) Check that the OPC Belt Cartridge is installed correctly.
Missing image at edge 	1) Replace the toner cartridge. 2) Replace the OPC Belt Cartridge.
Wrinkle 	1) Check that the problem is solved after changing to a recommended type of paper. 2) Check that the rear access cover is closed correctly. 3) Check that the paper discharger is installed correctly.
Mixed color image 	1) Check that the front cover is closed correctly. 2) Check that the toner cartridges are installed correctly. 3) Replace the toner cartridges.
Insufficient Gloss	1) Check that the oil is not empty. 2) Replace the Fuser Cleaning Roller. 3) Check that the specified paper is being used.

Question	Recommendation
Off set image 	1) Check that the specified paper is being used. 2) Check that the oil is not empty. 3) Replace the Fuser Cleaning Roller
Poor fixing 	1) Check that the specified paper is used. 2) Check that the media type mode is selected correctly.
Poor fixing	Wait 15 to 30 minutes and try again.
Poor fixing when printed on thick paper	Set the printer to thick paper mode through the control panel or the printer driver.
Blurred vertical band and spots of color. 	Clean the Charging Wire as shown below: 1. Open the Front Cover and take the Cleaning Brush out of the printer.  2. Open the Top Cover and take the (OPC) Belt Cartridge out of the printer. 3. Brush the Charging Wire with the Cleaning brush as shown below. 
Dirt on the printed paper. 	Clean the Paper Guide, the Registration Roller and the Exit Roller referring to ‘Periodic Printer Cleaning’ in Chapter 5.

If the same problem re-occurs, contact your dealer or Brother authorized service representative.

Caution

Operation of the printer outside the specifications shall be deemed abuse and all repairs thereafter shall be the sole liability of the end user/purchaser.

(For USA & CANADA Only)

For technical and operational assistance, please call:

In USA	1-877-284-3238	
In CANADA	1-800-853-6660	
	514-685-6464	(within Montreal)

If you have comments or suggestions, please write us at:

In USA	Printer Customer Support Brother International Corporation 15 Musick Irvine, CA 92618
In CANADA	Brother International Corporation (Canada), Ltd. - Marketing Dept. 1, rue Hôtel de Ville Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS
For downloading drivers from our Bulletin Board Service, call:

In USA	1-888-298-3616
In CANADA	1-514-685-2040

Please log on to our BBS with your first name, last name and a four digit number for your password. Our BBS supports modem speeds up to 14,400, 8 bits no parity, 1 stop bit.

Fax-Back System
Brother Customer Service has installed an easy to use Fax-Back System so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one you are calling from.
Please call 1-800-521-2846 (USA) or 1-800-681-9838 (Canada) and follow the voice prompts to receive faxed instructions on how to use the system and your index of Fax-Back subjects.

DEALERS/SERVICE CENTERS (USA only)
For the name of an authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

APPENDICES

PRINTER SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm Output: 5mW max.
Resolution	300x300 dots per inch (Draft) 600x600 dots per inch (Fine) 1200x600 dots per inch 2400x600 dots per using CAPT and HRC(The resolution can be enhanced to 2400 dpi class by using Brother exclusive HRC (High Resolution Control) and
CAPT	(Color Advanced Photoscale Technology)
Print Speed	16 pages per minute (A4/Letter size in monochrome) 4 pages per minute (A4/Letter size in full color)
Warm Up	Max. 3 minutes at 20°C (68°F)
First Print	Monochrome: 19 seconds or less Full Color: 30 seconds or less (A4/Letter size by face down print delivery from standard upper cassette feed)
Consumables	Toner in a single color single-component cartridge Life Expectancy: 10,000 (Black): 6,000 (Cyan, Magenta andYellow) single-sided pages/cartridge (A4 or letter size paper with about 5% coverage).
Resident Printer Fonts	72 scalable fonts, 12 bitmapped fonts, 11 barcode fonts

Functions

CPU	VR4310
Emulation	Automatic emulation selection • HP Color Printer (PCL5C) including HP LaserJet 4+ (PCL 5e) and HP LaserJet 5 (PCL 6) monochrome mode • BR-Script Level 2 (Adobe Postscript Level 2 compatible) • HP-GL • EPSON FX-850 • IBM Proprinter XL
Interface	Automatic interface selection among bi-directional parallel, RS-232C serial, NC-3100h and MIO interface.
RAM	32 Mbyte (expandable to 288Mbytes with DIMMs) The standard memory fitted can vary depending on the printer model and country.
HDD option	2.5 inch IDE HDD
Card Slots	2 slots for PCMCIA Type I, II 1 card slot: PCMCIA Type III Compatible for FLASH Memory or HDD cards
Control Panel	8 switches, 4 lamps and 16-column by 2-lines liquid crystal display
Diagnostics	Self-diagnostic program

Electrical and Mechanical

Power Source	U.S.A. and Canada:	AC 120 V, 50/60 Hz
	Europe and Australia:	AC 220 to 240V, 50/60 Hz
Power Consumption	Printing (Average):	450 W or less
	Stand-by:	150 W or less
	Stand-by in sleep mode:	35 W or less
Noise	Printing:	55 dB A or less
	Stand-by:	48 dB A or less
Temperature	Operating:	10 to 32.5°C (50°F to 90.5°F)
	Non operational:	5 to 35°C (41°F to 95°F)
	Storage:	0 to 35°C (38°F to 95°F)
Humidity	Operating:	20 to 80% (without condensation)
	Storage:	20 to 80% (without condensation)
Dimensions (W x H x D)	500 x 388 x 490 mm (19.5 x 15.3 x 19.3 inches) 500 x 493 x 490 mm (19.5 x 19.4 x 19.1 inches) with an optional lower tray unit fitted	
Weight	Approx. 37 kg (81.6 lbs.) Approx. 42.5 kg (93.7 lbs.) with optional lower tray unit and toner cartridges installed.	

PAPER SPECIFICATIONS

Paper Input

Media Trays :

- Standard upper tray (Tray 1)
- Optional lower tray (Tray 2)
- Paper size:
 TRAY 1: Letter, A4, ISO B5, JIS B5, Executive, A5, COM10, DL and ISO B5
 TRAY 2: Letter, A4, ISO B5, JIS B5, Executive, A5,
 (Legal for Optional Legal Cassette)
- Max. stacking height in the cassette = 27 mm(1.06")
- Max. paper cassette capacity = Approx. 250 sheets of 75g/m^2 (20 lbs)

Printed Output

Face down print delivery

Paper Type

Standard upper tray (Tray 1) :

- Plain paper of letter, A4, ISO B5, JIS B5, A5, and Executive sizes
 100 x 210 mm to 216 x 297 mm
 (3.9 x 8.2" to 8.5 x 11.7")
 [60 to 160 g/m^2 (16 to 43 lbs)]
- Envelopes of COM10 DL sizes
- Transparencies
- label stocks

Optional lower tray (Tray 2) :

- Plain paper of letter, A4, ISO B5, JIS B5, A5, and Executive sizes
 100 x 210 mm to 216 x 297 mm
 (3.9 x 8.2" to 8.5 x 11.7")
 [60 to 160 g/m^2 (16 to 43 lbs)]
- label stocks

Optional legal tray (Tray 1/2) :

- Plain paper of letter, legal, A4, ISO B5, JIS B5, A5, and Executive sizes
 100 x 210 mm to 216 x 356 mm
 (3.9 x 8.2" to 8.5 x 14")
 [60 to 160 g/m^2 (16 to 43 lbs)]
- Envelopes of COM10 and DL sizes
- Transparencies
- label stocks

Test printing on paper, especially envelopes, is recommended before making a large purchase. The following types of envelopes are not recommended for use.

- Envelopes with thick and/or crooked edges
- Damaged, curled, wrinkled, or irregularly shaped envelopes
- Extremely shiny or highly textured envelopes
- Envelopes with clasps
- Envelopes of baggy construction
- Envelopes not sharply creased
- Embossed envelopes
- Envelopes already printed with a laser printer
- Envelopes that cannot be arranged uniformly when placed in a pile

Notes

- An area 15 mm (0.6”) from the edges of the envelope will not be printed.
- Avoid feeding labels with the carrier sheet exposed otherwise your printer will be damaged.
- When feeding OHP film, the use of a recommended type for laser printers will ensure optimum printing. For detailed information on the specification or purchase, please contact your nearest authorized sales representative or the place of purchase.

■ PAPER

The printer is designed to work well with most types of xerographic and bond paper. However, some paper variables may have an effect on print quality or handling reliability. Always test samples of paper before buying to ensure that it provides desirable performance. Some important guidelines when selecting paper are:

1. Supplier should be informed that the paper or envelopes will be used in a laser printer.

2. Preprinted papers must use inks that can withstand the temperature of the printers fusing process. (200 degrees centigrade)

3. If you have selected a cotton bond paper, paper having a rough surface such as cockle or laid finished paper or paper that is wrinkled or puckered, these types of paper may exhibit degraded performance.

> **Note**
> The manufacturer does not warrant the use of any particular paper. The operator is responsible for the quality of paper used with the printer.

Paper Types to Avoid

Some types of paper might not perform well or may cause damage to your printer.

Types of paper to avoid are:

1. Highly textured paper.
2. Smooth or shiny paper.
3. Paper that is coated or has a chemical finish.
4. Damaged, wrinkled or pre-folded paper.
5. Paper exceeding the recommend weight specification specified in the manual.
6. Paper with tabs and staples.
7. Letterheads using low temperature dyes or thermography.
8. Multipart or carbonless paper.

DAMAGE OR OTHER DEFECTS CAUSED BY THE USE OF PAPERS LISTED UNDER "PAPER TYPES TOAVOID" WILL NOT BE COVERED UNDER ANY WARRANTY OR SERVICE AGREEMENTS.

■ ENVELOPES

Most envelopes will perform acceptably on your printer. However; some envelopes will have feeding and print quality problems because of their construction. A suitable envelope should have edges with a straight, well creased folds and should not have more than two thickness of paper along the lead edge. The envelope should lie flat and not have baggy or flimsy construction. Purchase quality envelopes only from a supplier who understands that the envelopes will be used in a laser printer. All envelopes should be tested prior to use to ensure desirable print results.

Envelope Types to Avoid

1. Envelopes constructed with a paper with a weight that exceeds the paper weight specifications for the printer.
2. Poorly manufactured envelopes with edges that are not straight or consistently square.
3. Envelopes with "baggy" construction or folds that are not sharply creased.
4. Envelopes with transparent windows, holes, cutouts or perforations.

5. Envelopes with clasps, snaps or tie strings.
6. Envelopes made with smooth or shiny paper.
7. Envelopes that are rough, highly textured, or deeply embossed.
8. Envelopes that do not lie flat or that are curled, wrinkled, or irregularly shaped.
9. Envelopes having an open flap with an adhesive that seals the envelope.

USE OF ANY OF THE ENVELOPES LISTED ABOVEMAY CAUSE DAMAGE TO YOUR PRINTER. SUCH DAMAGE IS NOT COVERED UNDER ANY WARRANTY OR SERVICE AGREEMENT.

> **Note**
> The manufacturer neither warrants nor recommends the use of a particular envelope because envelope properties are subject to change by the envelope manufacturer. The entire responsibility for the quality and performance of the envelope lies with the customer.

■ LABELS AND OVERHEAD TRANSPARENCIES

The printer will print on most type of labels and transparencies designed for use with a laser printer. Labels should have an adhesive that is acrylic-based since such material is more stable at the high temperatures in the fusing unit. Adhesives should not come in contact with any part of the printer, because the label stock may stick to the drum or rollers and cause jams and print quality problems. No adhesive should be exposed between the labels. Labels should be arranged so that they cover the entire page with the only exposed spaces being lengthwise down the sheet. Using labels with spaces may result in labels peeling off and causing serious jam or print problems.

All labels and transparencies used in this printer must be able to withstand a temperature of 200 degrees centigrade (392 degrees Fahrenheit) for a period of 0.1 seconds.

Label and transparency sheets should not exceed the paper weight specifications described in the User's Guide. Labels and transparencies exceeding this specification may not feed or print properly and cause damage to your printer.

The entire responsibility for the quality and performance of labels and transparencies lies with the customer.

DAMAGE CAUSED BY THE USE OF UNSATISFACTORY LABELS OR TRANSPARENCIES IS NOT COVERED UNDER ANY WARRANTY OR SERVICE AGREEMENTS.

INTERFACE SPECIFICATIONS

Bi-directional Parallel Interface

Interface Connector

A shielded cable that is IEEE 1284 compliant with the following pin assignment should be used. Most standard parallel cables support bi-directional communication, but some might have incompatible pin assignments or may not be IEEE 1284 compliant.

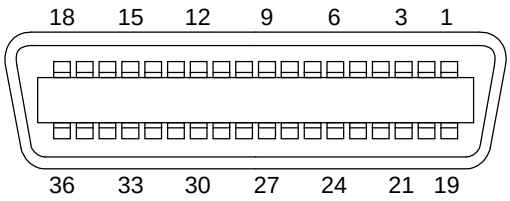


Fig. A-1 Parallel Interface Connector

Pin Assignment

Pin No.	Signal	Pin No.	Signal
1	$\overline{\text{DATA STROBE}}$	19	Twisted pair ground
2	DATA 0	20	Twisted pair ground
3	DATA 1	21	Twisted pair ground
4	DATA 2	22	Twisted pair ground
5	DATA 3	23	Twisted pair ground
6	DATA 4	24	Twisted pair ground
7	DATA 5	25	Twisted pair ground
8	DATA 6	26	Twisted pair ground
9	DATA 7	27	Twisted pair ground
10	$\overline{\text{ACKNLG}}$	28	Twisted pair ground
11	BUSY	29	Twisted pair ground
12	PE	30	$\overline{\text{INPUT PRIME RET}}$
13	SLCT	31	$\overline{\text{INPUT PRIME}}$
14	$\overline{\text{AUTO FEED}}$	32	$\overline{\text{FAULT}}$
15	N.C.	33	N.C.
16	0V	34	N.C.
17	0V	35	N.C.
18	+5V	36	$\overline{\text{SELECT IN}}$

Signal Description

Pin No.	Signal Name	IN/OUT	Explanation
1	$\overline{\text{DATA STROBE}}$	IN	Data is latched at the leading edge of this signal.
2 - 9	DATA 0 - 7	IN	Parallel 8 bit data
10	$\overline{\text{ACKNLG}}$	OUT	Data reception is completed and the printer is ready for the next data reception when this signal becomes low.
11	BUSY	OUT	The printer cannot receive data when this signal is high. The signal becomes high under data receiving, off-line, or error states.
12	PE	OUT	This signal becomes high when a paper empty state is detected.
13	SLCT	OUT	This signal becomes high when the printer is selected and low when it is deselected.
14	$\overline{\text{AUTO FEED}}$	IN	This signal is used only for the bi-directional interface.
31	$\overline{\text{INPUT PRIME}}$	IN	This signal is used only for the bi-directional interface.
32	$\overline{\text{FAULT}}$	OUT	This signal becomes low when the printer is in the paper empty, off-line, or error states.
36	$\overline{\text{SLCT IN}}$	IN	This signal is used only for the bi-directional interface.

Parallel Cable Connection for IBM-PC/AT or Compatible Computers and IBM-PS/2 Computers

Signal	Printer Pin No.	Computer Pin No.
$\overline{\text{DATA STROBE}}$	1 ———	1
DATA 0	2 ———	2
DATA 1	3 ———	3
DATA 2	4 ———	4
DATA 3	5 ———	5
DATA 4	6 ———	6
DATA 5	7 ———	7
DATA 6	8 ———	8
DATA 7	9 ———	9
$\overline{\text{ACKNLG}}$	10———	10
BUSY	11———	11
PE	12———	12
SLCT	13———	13
$\overline{\text{AUTO FEED}}$	14———	14
GND	19 - 30 ———	18 - 25
$\overline{\text{FAULT}}$	32———	15
$\overline{\text{SLCT IN}}$	36———	17

RS-232C Serial Interface

Standard Specifications

1)	Baud rate:	150, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200 baud
2)	Synchronization:	Start-stop
3)	Communications control:	No protocol
4)	Data length:	Serial 7 bits or 8 bits
5)	Parity:	Odd, even, or none
6)	Stop bit:	1 or 2 stop bits
7)	Protocol:	Xon/Xoff or DTR

Interface Connectors

A shielded cable should be used.

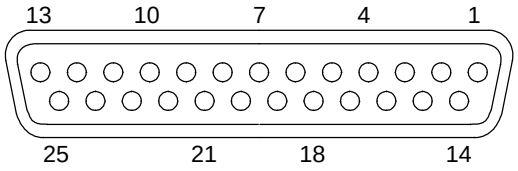


Fig. A-2 Serial Interface Connector

Pin Assignment

Pin No.	Signal	IN/OUT Printer	IN/OUT Controller	Pin No.	Signal	IN/OUT Printer	IN/OUT Controller
1	FG	←	→	14	NC		
2	SD		→	15	NC		
3	RD	←		16	NC		
4	RS		→	17	NC		
5	NC			18	NC		
6	DR	←		19	NC		
7	SG	←	→	20	ER		→
8	NC			21	NC		
9	NC			22	NC		
10	NC			23	NC		
11	NC			24	NC		
12	NC			25	NC		
13	NC						

Signal Description

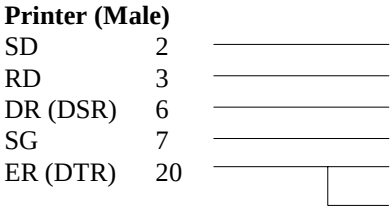
Signal Name	IN/OUT	Explanation
FG	–	Frame Ground
SD	OUT	Send Data.
RD	IN	Receive Data. Receives data transmitted from the computer.
RS	OUT	Request To Send. "SPACE" level when the printer is ready to send data to the computer.
DR	IN	Data Set Ready. When DSR is at "SPACE" level, data can be accepted.
SG	–	Signal Ground
ER	OUT	Data Terminal Ready. "MARK" level when the printer is Busy.

Serial Cable Connection for IBM-PC/AT or Compatible Computers and IBM-PS/2 Computers

The following diagrams show the pin connections for the most common serial communications.

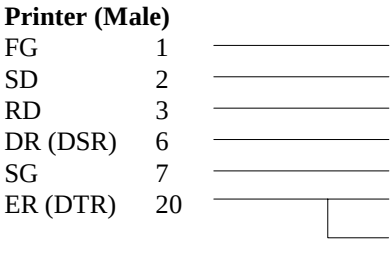
■ DB-9 Serial Connection

When you use a computer with a 9-pin serial port, use a cable with the following pin configurations.



■ DB-25 Serial Connection

When you use a computer with a 25-pin serial port, use a cable with the following pin configurations.



Note
Any pins not shown in the figures above are not connected.

Network Interface

Network Interface

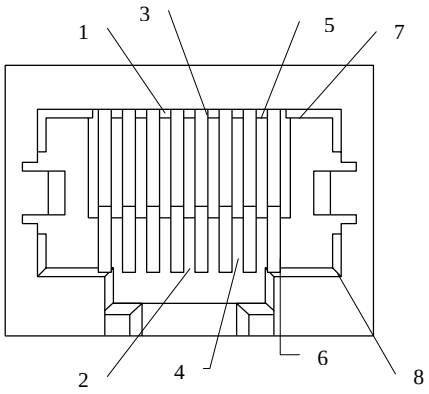


Fig. A-3 10/100Base TX Port

Pin Assignment

RJ45 pin	Signal
1 TX+	Transmit Data +
2 TX–	Transmit Data –
3 RX+	Receive Data +
4	N.C.
5	N.C.
6 RX–	Receive Data –
7	N.C.
8	N.C.

For more information, see the "Network User's Guide" on the CD-ROM.

SYMBOL/CHARACTER SETS

You can select the symbol and character sets with the FONT switch in the HP LaserJet, EPSON FX-850, and IBM Proprinter XL emulation modes. See "FONT Button" in Chapter 4.

When you have selected the HP-GL emulation mode, you can select the standard or alternate character set with the MODE switch. See "GRAPHICS MODE" in Chapter 4.

OCR Symbol Sets

When the OCR-A or OCR-B font is selected, the corresponding symbol set is always used.

OCR-A
OCR-B

HP PCL Mode

Roman 8 (8U)
ISO Latin1 (0N)
ISO Latin2 (2N)
ISO Latin5 (5N)

PC-8 (10U)
PC-8 D/N (11U)
PC-850 (12U)
PC-852 (17U)

PC-8 Turkish (9T)
Windows Latin1 (19U)
Windows Latin2 (9E)
Windows Latin5 (5T)

Legal (1U)
Ventura Math (6M)
Ventura Intl (13J)
Ventura US (14J)

PS Math (5M)
PS Text (10J)
Math-8 (8M)
Pi Font (15U)

MS Publishing (6J)
Windows 3.0 (9U)
Desktop (7J)
MC Text (12J)

Symbol (19M)
Windings (579L)

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are hexadecimal code values with which characters are to be replaced in the Roman 8 character set. For other characters, see the Roman 8 character set.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
ISO 2 IRV												
ISO 4 UK												
ISO 6 ASCII												
ISO10 SWE/FIN												
ISO11 Swedish												
ISO14 JISASCII												
ISO15 Italian												
ISO16 POR												
ISO17 Spanish												
ISO21 German												
ISO25 French												
ISO57 Chinese												
ISO60 NOR v1												
ISO61 NOR v2												
ISO69 French												
ISO84 POR												
ISO85 Spanish												
HP German												
HP Spanish												

EPSON Mode

US ASCII

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are hexadecimal code values with which characters are to be replaced in the US ASCII character set. For other characters, see the US ASCII character set.

CHARACTER SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
German												
UK ASCII I												
French I												
Danish I												
Italy												
Spanish												
Swedish												
Japanese												
Norwegian												
Danish II												
UK ASCII II												
French II												
Dutch												
South African												

PC-8
PC-8 D/N
PC-850
PC-852

PC-860
PC-863
PC-865
PC-8 Turkish

IBM Mode

PC-8
PC-8 D/N
PC-850
PC-852

PC-860
PC-863
PC-865
PC-8 Turkish

HP-GL Mode

ANSI ASCII
9825 CHR. SET

FRENCH/GERMAN
SCANDINAVIAN
SPANISH/LATIN
JIS ASCII

ROMAN8 EXT.
ISO IRV
ISO SWEDISH
ISO SWEDISH:N

ISO NORWAY 1
ISO GERMAN
ISO FRENCH
ISO U.K.

ISO ITALIAN
ISO SPANISH
ISO PORTUGUESE
ISO NORWAY 2

Symbol Sets Supported by the Printer's Intellifont Compatible Typefaces

PCL Symbol Set		Typeface						
Set ID	Symbol Set	Alaska	Antique Oakland	Brougham	Cleveland Cond.	Connect-icut	Guatemala Antique	Letter Gothic
8U	Roman-8	•	•	•	•	•	•	•
0N	ISO 8859-1 Latin1	•	•	•	•	•	•	•
2N	ISO 8859-2 Latin2	•	•	•	•	•	•	•
5N	ISO 8859-9 Latin5	•	•	•	•	•	•	•
6N	ISO 8859-10 Latin6	•	•	•	•	•	•	•
10U	PC-8	•	•	•	•	•	•	•
11U	PC-8 D/N	•	•	•	•	•	•	•
12U	PC-850	•	•	•	•	•	•	•
17U	PC-852	•	•	•	•	•	•	•
26U	PC-775	•	•	•	•	•	•	•
9T	PC-Turk	•	•	•	•	•	•	•
19U	Windows 3.1 Latin1	•	•	•	•	•	•	•
9E	Windows 3.1 Latin2	•	•	•	•	•	•	•
5T	Windows 3.1 Latin5	•	•	•	•	•	•	•
7J	DeskTop	•	•	•	•	•	•	•
9J	PC-1004 (OS/2)	•	•	•	•	•	•	•
10J	PS Text	•	•	•	•	•	•	•
13J	Ventura International	•	•	•	•	•	•	•
14J	Ventura US	•	•	•	•	•	•	•
6J	Microsoft Publishing	•	•	•	•	•	•	•
8M	Math-8	•	•	•	•	•	•	•
5M	PS Math	•	•	•	•	•	•	•
6M	Ventura Math	•	•	•	•	•	•	•
15U	PI Font	•	•	•	•	•	•	•
1U	Legal	•	•	•	•	•	•	•
1E	ISO 4: United Kingdom*	•	•	•	•	•	•	•
0U	ISO 6: ASCII*	•	•	•	•	•	•	•
2U	ISO 2: IRV*	•	•	•	•	•	•	•
0S	ISO 11: Swedish: names*	•	•	•	•	•	•	•
0I	ISO 15: Italian*	•	•	•	•	•	•	•
1S	HP Spanish*	•	•	•	•	•	•	•
2S	ISO 17: Spanish*	•	•	•	•	•	•	•
3S	ISO 10: Swedish*	•	•	•	•	•	•	•
4S	ISO 16: Portuguese*	•	•	•	•	•	•	•
5S	ISO 84: Portuguese*	•	•	•	•	•	•	•
6S	ISO 85: Spanish*	•	•	•	•	•	•	•
0G	HP German*	•	•	•	•	•	•	•
1G	ISO 21: German*	•	•	•	•	•	•	•
0D	ISO 60: Norwegian 1*	•	•	•	•	•	•	•
1D	ISO 61: Norwegian 2*	•	•	•	•	•	•	•
0F	ISO 25: French*	•	•	•	•	•	•	•
1F	ISO 69: French*	•	•	•	•	•	•	•
0K	ISO 14: JIS ASCII*	•	•	•	•	•	•	•
2K	ISO 57: Chinese*	•	•	•	•	•	•	•
9U	Windows 3.0 Latin1	•	•	•	•	•	•	•
12J	MC Text	•	•	•	•	•	•	•
19M	Symbol							
19L	Windows Baltic	•	•	•	•	•	•	•
579L	Wingdings							

*These symbol sets are variations of the Roman-8 symbol set.

PCL Symbol Set		Typeface(Continued)						
Set ID	Symbol Set	LetterGothic 16.66**	Mary-land	Oklahoma	PC Brussels	PC Tennessee	Utah	Utah Cond.
8U	Roman-8	•	•	•	•	•	•	•
0N	ISO 8859-1 Latin1	•	•	•	•	•	•	•
2N	ISO 8859-2 Latin2	•	•	•	•	•	•	•
5N	ISO 8859-9 Latin5	•	•	•	•	•	•	•
6N	ISO 8859-10 Latin6	•	•	•		•	•	•
10U	PC-8	•	•	•	•	•	•	•
11U	PC-8 D/N	•	•	•	•	•	•	•
12U	PC-850	•	•	•	•	•	•	•
17U	PC-852		•	•	•	•	•	•
26U	PC-775		•	•		•	•	•
9T	PC-Turk		•	•	•	•	•	•
19U	Windows 3.1 Latin1		•	•	•	•	•	•
9E	Windows 3.1 Latin2		•	•	•	•	•	•
5T	Windows 3.1 Latin5		•	•	•	•	•	•
7J	DeskTop		•	•	•	•	•	•
9J	PC-1004(OS/2)		•	•		•	•	•
10J	PS Text		•	•	•	•	•	•
13J	Ventura International		•	•	•	•	•	•
14J	Ventura US		•	•	•	•	•	•
6J	Microsoft Publishing		•	•	•	•	•	•
8M	Math-8					•	•	
5M	PS Math					•	•	
6M	Ventura Math					•	•	
15U	PI Font					•	•	
1U	Legal	•	•	•	•	•	•	•
1E	ISO 4: United Kingdom*	•	•	•	•	•	•	•
0U	ISO 6: ASCII*	•	•	•	•	•	•	•
2U	ISO 2: IRV*	•	•	•	•	•	•	•
0S	ISO 11: Swedish: names*	•	•	•	•	•	•	•
0I	ISO 15: Italian*	•	•	•	•	•	•	•
1S	HP Spanish*	•	•	•	•	•	•	•
2S	ISO 17: Spanish*	•	•	•	•	•	•	•
3S	ISO 10: Swedish*	•	•	•	•	•	•	•
4S	ISO 16: Portuguese*	•	•	•	•	•	•	•
5S	ISO 84: Portuguese*	•	•	•	•	•	•	•
6S	ISO 85: Spanish*	•	•	•	•	•	•	•
0G	HP German*	•	•	•	•	•	•	•
1G	ISO 21: German*	•	•	•	•	•	•	•
0D	ISO 60: Norwegian 1*	•	•	•	•	•	•	•
1D	ISO 61: Norwegian 2*	•	•	•	•	•	•	•
0F	ISO 25: French*	•	•	•	•	•	•	•
1F	ISO 69: French*	•	•	•	•	•	•	•
0K	ISO 14: JIS ASCII*	•	•	•	•	•	•	•
2K	ISO 57: Chinese*	•	•	•	•	•	•	•
9U	Windows 3.0 Latin1		•	•	•	•	•	•
12J	MC Text		•	•	•	•	•	•
19M	Symbol							
19L	Windows Baltic		•	•		•	•	•
579L	Wingdings							

*These symbol sets are variations of the Roman-8 symbol set.
**LetterGothic 16.66 is a bitmapped font.

Symbol Sets Supported by the Printer's TrueType™ and Type 1 Font Compatible, and Original Typefaces

PCL Symbol Set		Typeface							
Set ID	Symbol Set	Atlanta	BR Symbol	Copen-hagen	Calgary	Helsinki	Portugal	Tennes-see	W Dingbats
8U	Roman-8	•		•	•	•	•	•	
0N	ISO 8859-1 Latin1	•		•	•	•	•	•	
2N	ISO 8859-2 Latin2					•		•	
5N	ISO 8859-9 Latin5					•		•	
6N	ISO 8859-10 Latin6					•		•	
10U	PC-8	•		•	•	•	•	•	
11U	PC-8 D/N	•		•	•	•	•	•	
12U	PC-850	•		•	•	•	•	•	
17U	PC-852					•		•	
26U	PC-775					•		•	
9T	PC-Turk					•		•	
19U	Windows 3.1 Latin1	•		•	•	•	•	•	
9E	Windows 3.1 Latin2					•		•	
5T	Windows 3.1 Latin5					•		•	
7J	DeskTop	•		•	•	•	•	•	
9J	PC-1004 (OS/2)					•		•	
10J	PS Text	•		•	•	•	•	•	
13J	Ventura International	•		•	•	•	•	•	
14J	Ventura US	•		•	•	•	•	•	
6J	Microsoft Publishing	•		•	•	•	•	•	
8M	Math-8					•		•	
5M	PS Math					•		•	
6M	Ventura Math					•		•	
15U	PI Font					•		•	
1U	Legal	•		•	•	•	•	•	
1E	ISO 4: United Kingdom*	•		•	•	•	•	•	
0U	ISO 6: ASCII*	•		•	•	•	•	•	
2U	ISO 2: IRV*	•		•	•	•	•	•	
0S	ISO 11: Swedish: names*	•		•	•	•	•	•	
0I	ISO 15: Italian*	•		•	•	•	•	•	
1S	HP Spanish*	•		•	•	•	•	•	
2S	ISO 17: Spanish*	•		•	•	•	•	•	
3S	ISO 10: Swedish*	•		•	•	•	•	•	
4S	ISO 16: Portuguese*	•		•	•	•	•	•	
5S	ISO 84: Portuguese*	•		•	•	•	•	•	
6S	ISO 85: Spanish*	•		•	•	•	•	•	
0G	HP German*	•		•	•	•	•	•	
1G	ISO 21: German*	•		•	•	•	•	•	
0D	ISO 60: Norwegian 1*	•		•	•	•	•	•	
1D	ISO 61: Norwegian 2*	•		•	•	•	•	•	
0F	ISO 25: French*	•		•	•	•	•	•	
1F	ISO 69: French*	•		•	•	•	•	•	
0K	ISO 14: JIS ASCII*	•		•	•	•	•	•	
2K	ISO 57: Chinese*	•		•	•	•	•	•	
9U	Windows 3.0 Latin1	•		•	•	•	•	•	
12J	MC Text	•		•	•	•	•	•	
19M	Symbol		•						
19L	Windows Baltic					•		•	
579L	Wingdings								•

*These symbol sets are variations of the Roman-8 symbol set.

PCL Symbol Set		Typeface			
		Bermuda Script	Germany	San Diego	US Roman
Set ID	Symbol Set				
8U	Roman-8	•	•	•	•
0N	ISO 8859-1 Latin1	•	•	•	•
2N	ISO 8859-2 Latin2				
5N	ISO 8859-9 Latin5				
6N	ISO 8859-10 Latin6				
10U	PC-8	•	•	•	•
11U	PC-8 D/N	•	•	•	•
12U	PC-850	•	•	•	•
17U	PC-852				
26U	PC-775				
9T	PC-Turk				
19U	Windows 3.1 Latin1	•	•	•	•
9E	Windows 3.1 Latin2				
5T	Windows 3.1 Latin5				
7J	DeskTop	•	•	•	•
9J	PC-1004 (OS/2)				
10J	PS Text	•	•	•	•
13J	Ventura International	•	•	•	•
14J	Ventura US	•	•	•	•
6J	Microsoft Publishing	•	•	•	•
8M	Math-8				
5M	PS Math				
6M	Ventura Math				
15U	PI Font				
1U	Legal	•	•	•	•
1E	ISO 4: United Kingdom*	•	•	•	•
0U	ISO 6: ASCII*	•	•	•	•
2U	ISO 2: IRV*	•	•	•	•
0S	ISO 11: Swedish: names*	•	•	•	•
0I	ISO 15: Italian*	•	•	•	•
1S	HP Spanish*	•	•	•	•
2S	ISO 17: Spanish*	•	•	•	•
3S	ISO 10: Swedish*	•	•	•	•
4S	ISO 16: Portuguese*	•	•	•	•
5S	ISO 84: Portuguese*	•	•	•	•
6S	ISO 85: Spanish*	•	•	•	•
0G	HP German*	•	•	•	•
1G	ISO 21: German*	•	•	•	•
0D	ISO 60: Norwegian 1*	•	•	•	•
1D	ISO 61: Norwegian 2*	•	•	•	•
0F	ISO 25: French*	•	•	•	•
1F	ISO 69: French*	•	•	•	•
0K	ISO 14: JIS ASCII*	•	•	•	•
2K	ISO 57: Chinese*	•	•	•	•
9U	Windows 3.0 Latin1	•	•	•	•
12J	MC Text	•	•	•	•
19M	Symbol				
19L	Windows Baltic				
579L	Wingdings				

*These symbol sets are variations of the Roman-8 symbol set.

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